

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

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"FLIGHT" PHOTOGRAPHS.

To those desirous of obtaining copies of "Flight" Photographs, these can be supplied, enlarged or otherwise, upon application to Photo. Department, 36, Great Queen Street, W.C.2

For Sizes and Prices, see Advert. on page xxii.

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1928

- Feb. 16 "Experiments on Model Airscrews at High Tip Speeds." Mr. G. P. Douglas, before R.Ae.S. & Inst.Ae.E.
- Mar. 1 "Experiences with the Baghdad Air Mail." Wing-Com. R. M. Hill, before R.Ae.S. & Inst.Ae.E.
- Mar. 3 Rugby, Navy v. Army, at Twickenham
- Mar. 3 Aero Golfing Soc.—Team Match v. Moor Park G.C.
- Mar. 15 "Testing of Materials Used in Aircraft Construction." Dr. Rudolf, before R.Ae.S. & Inst. Ae.E.
- Mar. 15 Aero Golfing Soc.—Winter Meeting, Sir Samuel Instone Challenge Cup

EDITORIAL COMMENT



WITH the launch, at Rochester, on Monday of this week of the Short "Calcutta" three-engined flying-boat, yet another step has been taken towards improved Empire communications. The machine, as is well known, is intended for operation by Imperial Airways, Ltd., when it has passed the usual tests at Felixstowe, and thus there is reason to hope that in the not too distant future, we may see the beginning of a service operating over the sea which is of real practical utility. The Southampton service to the Channel Islands has probably been of value in gathering experience, but that it now has any practical utility as a route, few will claim. The weekly round trip has been made, and the Supermarine machines have done remarkably well, frequently under extremely bad weather conditions, but the route chosen was scarcely worthy of the machines used on it, which would have been capable of operating a service over almost any other route offering greater prospects of practical utility. Not that we have any desire to be in any way unfair to Imperial Airways. Cherbourg might have been a more useful terminus, but Cherbourg is a French port, and, moreover, a French seaplane service station, and it is thus not to be wondered at that there were difficulties in the way of arranging for the route to be laid there. With the new flying stock being produced at Rochester, however, services of a very different character must be established if we are to make any real headway. The new machines, the first all-metal British flying-boats to be used for commercial work, with their three Bristol "Jupiter" engines, should, by their ability to fly on any two engines, be to all intents and purposes immune from forced landings, and thus routes of a very different nature should become available. The new craft are designed to have a normal range of 500 miles, and it should not be difficult to find in the Empire portions of trade routes over which the operation of fast flying-boats would effect a very considerable speeding-up of communications.

The Supermarine "Southampton" flying boats have arrived safely in the Far East, after an excellent

cruise. The Blackburn "Iris" has done some very good overload trials at Felixstowe, and has, in addition dragged her moorings in a 75-m.p.h. wind without damage to herself, so that, taking it all round, we have cause to be satisfied with our flying-boat progress recently. Let us hope that 1928 will see the beginning of real Empire seaplane services.

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Bravo Hinkler!

By his flight in a week from London to Karachi, Mr. "Bert" Hinkler has added yet another triumph to his previous successes in long-distance flights on low-powered machines. When it is remembered that the "Cirrus" engine of the "Avian" is only of 80 h.p. or so, the fact that Hinkler should have been able to cover a distance of more than 4,000 miles in one week is proof that the British light plane has now reached a stage of development where it is a really practical proposition and not a mere "toy." Owing to the fact that, for financial reasons, Hinkler has had to arrange for the sale of his "story" exclusively, there is little information available at the moment concerning his flight so far, but the very fact that he has been able to make such good time indicates that he cannot have had much, if any, trouble with either machine or engine. Thus, there is reason to hope that forthcoming stages of his flight to Australia will be equally successful, and that he may succeed in a project which he has long entertained, but which he has not hitherto been in a position to realise.

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A Tale of Two Cities

It is now several months since we first announced that an international aero exhibition is to be held in Berlin in October next, and we then pointed out that, as this is to be the first show of this kind to be

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THE MILAN-MUNICH AIR LINE

ALTHOUGH the distance from Milan to Munich is only 225 miles, the journey by air is probably one of the most difficult, but at the same time picturesque, in Europe. The Avio Linee Italiane S.A., of Rome, will shortly open this air line with a fleet of Armstrong-Siddeley "Lynx"-engined Fokkers.

Milan is only 900 ft. above sea level, and as some of the Alps are over 12,000 ft. high, machines going north have only a few miles over the Italian plains in which to gain height.

The run south is not quite so severe because Munich is 3,000 ft. above sea level and the mountains do not rise as abruptly as on the southern side.

Immediately after leaving Milan the machine passes over Monza, the famous motor racing track and a moment or two later the easterly leg of Lake Como comes into sight. In front rise the majestic barriers of the Berganese Alps topped by Mount Redorta, nearly 10,000 ft. high. The town of Sondrio is an easily-found landmark with the river, road and railway jostling each other down a narrow valley running east and west. Snow-clad pinnacles and fields of jagged rock now give place to the pasture of the valleys and the journey progresses over the Bernina Pass that joins St. Moritz with Tirano.

A few minutes later the stately Ortler, nearly 12,000 ft. high, is seen gleaming white with a trail of green pasture-land to its west indicating the approach of the highest motor road in Europe. Green valleys and snow-clad mountains follow each other in rapid succession, but gradually the country seems to take on a less cruel and jagged appearance. The mountains drop away towards the Bavarian border, and the last twenty miles farther to Munich, the journey's end, is comparatively tame.

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At the February Investiture

HIS MAJESTY THE KING held an Investiture at Buckingham Palace on February 14, at which Air-Marshal Sir John Salmond and Group-Capt. P. F. M. Fellowes, R.A.F., were present. The following were amongst those invested by

organised by Germany after the war, the I.L.A. is sure to be one of more than ordinary interest. That being so, it is very important that Great Britain should be well represented, and we gather that there is every probability that several British firms will exhibit in Berlin.

Now comes the news that France has decided to advance the date of the Paris aero show in the Grand Palais to June. Hitherto this show has always been held in the late autumn, and the announcement that this year the Paris show will be held in June has therefore come as somewhat of a surprise. What has influenced the Chambre Syndicale des Industries Aeronautique to take this decision is set forth as being in celebration of the 20th anniversary of the first flight in a closed circuit, but it is permissible to assume that a desire to steal a march on Germany may have had something to do with it. Whatever the reason, the decision must naturally affect the British aircraft industry considerably, since it seems likely that a good many firms would wish to exhibit at both shows, but will not feel justified in incurring the expense of two shows. If the Air Ministry can persuade the Treasury to give a grant towards the expenses, it may be possible to arrange to exhibit at both places, and in the interests of British prestige it is very much to be hoped that this will be done. Failing that, it might be possible to divide the British firms so as to let one section show at Paris and the other at Berlin. We gather that Germany desires her show to be mainly of a commercial character. The Paris shows, on the other hand, are always preponderatingly military in character, so that it would seem possible to let firms who manufacture commercial aircraft exhibit at Berlin, and firms desiring to sell military types to show at Paris.

□ □

the King with the respective Divisions of the Orders into which they have been admitted:—

Order of the Bath

To be a Companion. Military Division:—Air Commodore Hugh Dowding, R.A.F.

Order of the British Empire (Civil Division)

To be a Dame Commander:—The Duchess of Bedford.

Order of the British Empire (Military Division)

To be an Officer:—Wing Commander Edward Corballis, R.A.F.

His Majesty then conferred decorations, amongst which were the following:—

Bar to the Air Force Cross

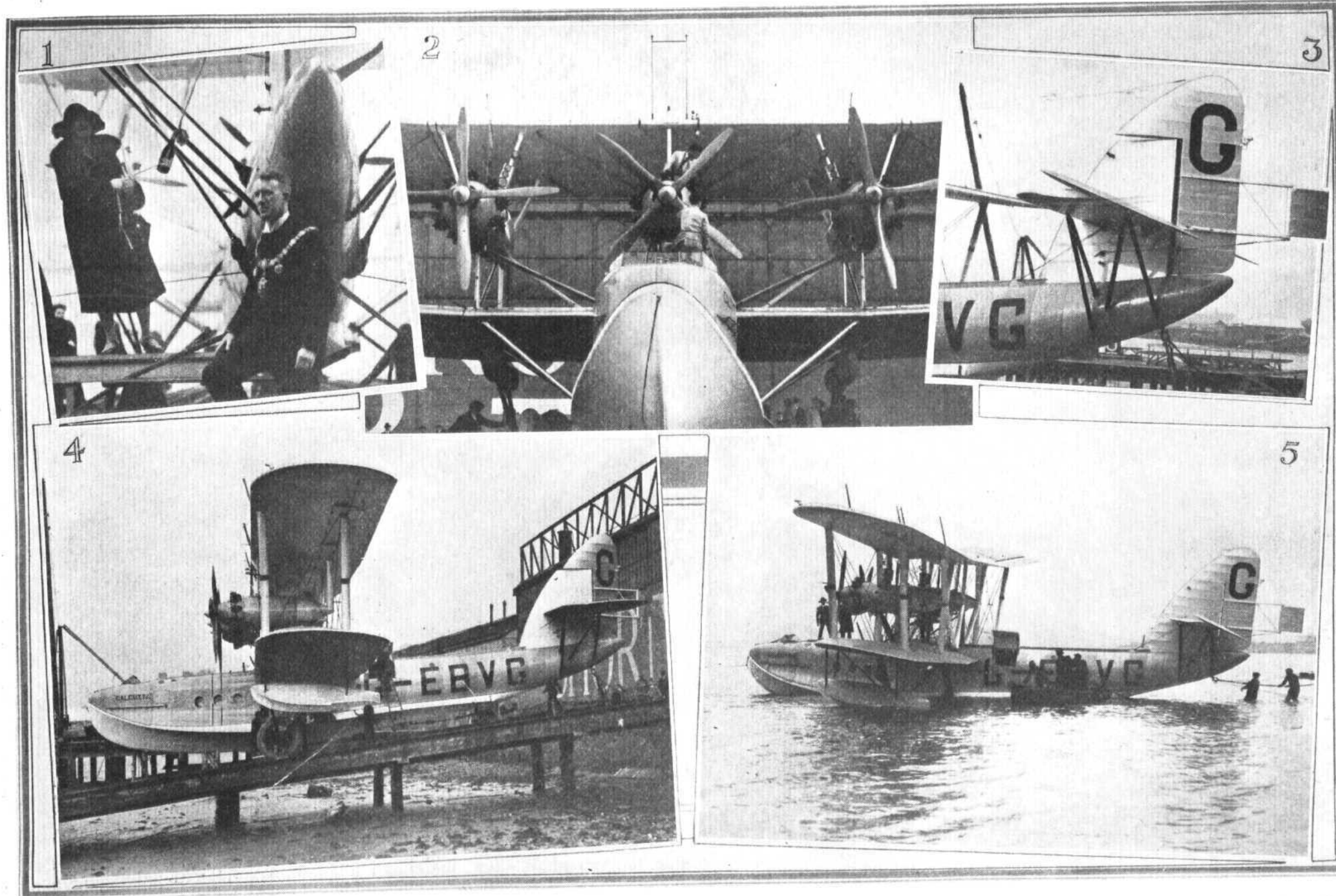
Flight-Lieut. Sidney Webster, R.A.F.

Air Force Cross

Flight-Lieut. Charles Carr, R.A.F., and Flight-Lieut. Robert Ragg, R.A.F.

Launch of First Short "Calcutta"

THE first of the "Jupiter"-engined "Calcutta" flying-boats designed and built by Short Brothers for operation by Imperial Airways, Limited, was launched at Rochester on Monday of this week, February 13. A large number of guests had been invited, and the Mayoress of Rochester (Mrs. F. C. A. Matthews) performed the christening ceremony by breaking a bottle of champagne on the stern of the "Calcutta." The large machine was then lowered into the water, and the launch was over, the machine being moored in the Medway until the state of the tides and wind should allow of making the first test flight. This occurred the next evening, when Mr. Lankester Parker, Short's test pilot, took the machine for a short flight around the district. As far as it was possible to ascertain from a first flight, the machine was in perfect trim and handled very nicely. Further tests are to be made in the near future. (The Short "Calcutta" was first described in FLIGHT of January 6, 1927, when complete general arrangement drawings were published.)



EMPIRE AIR COMMUNICATIONS : Launch at Rochester of the first of the Short "Calcutta" flying-boats with three Bristol "Jupiter" engines built for Imperial Airways, Ltd. 1, The Mayoress of Rochester christening the machine. 2, Front view showing the "Jupiter" engines. 3, The tail of the "Calcutta." Note the servo rudder. 4 and 5, Views of the machine on the slipway and afloat after the launch.

["FLIGHT" Photographs]

WINNER OF THE SCHNEIDER RACE

First Description of the Supermarine S.5

As the winner of the 1927 race for the Schneider Seaplane Trophy, and as a potential holder of the world's speed record in the near future, the Supermarine S.5 with Napier "Lion" racing engine is one of the most interesting of modern British aircraft, and it is with a good deal of satisfaction that we are able to place before our readers this week some particulars and a number of illustrations of its more interesting features. In his paper read recently before the R.Ae.S. & I.Ae.E., Mr. R. J. Mitchell, chief engineer of the Supermarine Aviation Works, gave certain very interesting figures relating to the S.5, but owing to the fact that the results of wind tunnel tests could not be published, much information which would have been extremely interesting had to be withheld. Nor are we, for obvious reasons, in a position to give these here. For instance, the proportion of the total drag represented by the fuselage, the floats, the float struts, and the wings. But in the absence of such information it is permissible to speculate a little and to attempt to form, from other sources, an idea of the efficiency of a machine like the S.5. Probably the "Everling Quantities"* afford the simplest available means of doing this, and of the three "Everling Quantities" it is, in this case, particularly the "High-speed Figure" in which we are interested. In his article Professor Everling arrived at a value of the "High-speed Figure" of 40 as a sort of theoretical maximum or "ideal," and pointed out that actual machines never attained this, but generally reached a value of about half of the "ideal." The Everling formula for "High-speed Figure" is, for ground level flight such as would apply to a racing machine like the S.5

$$\frac{\eta}{C_w} = \frac{V^3 \times F}{56,000 \times N}$$

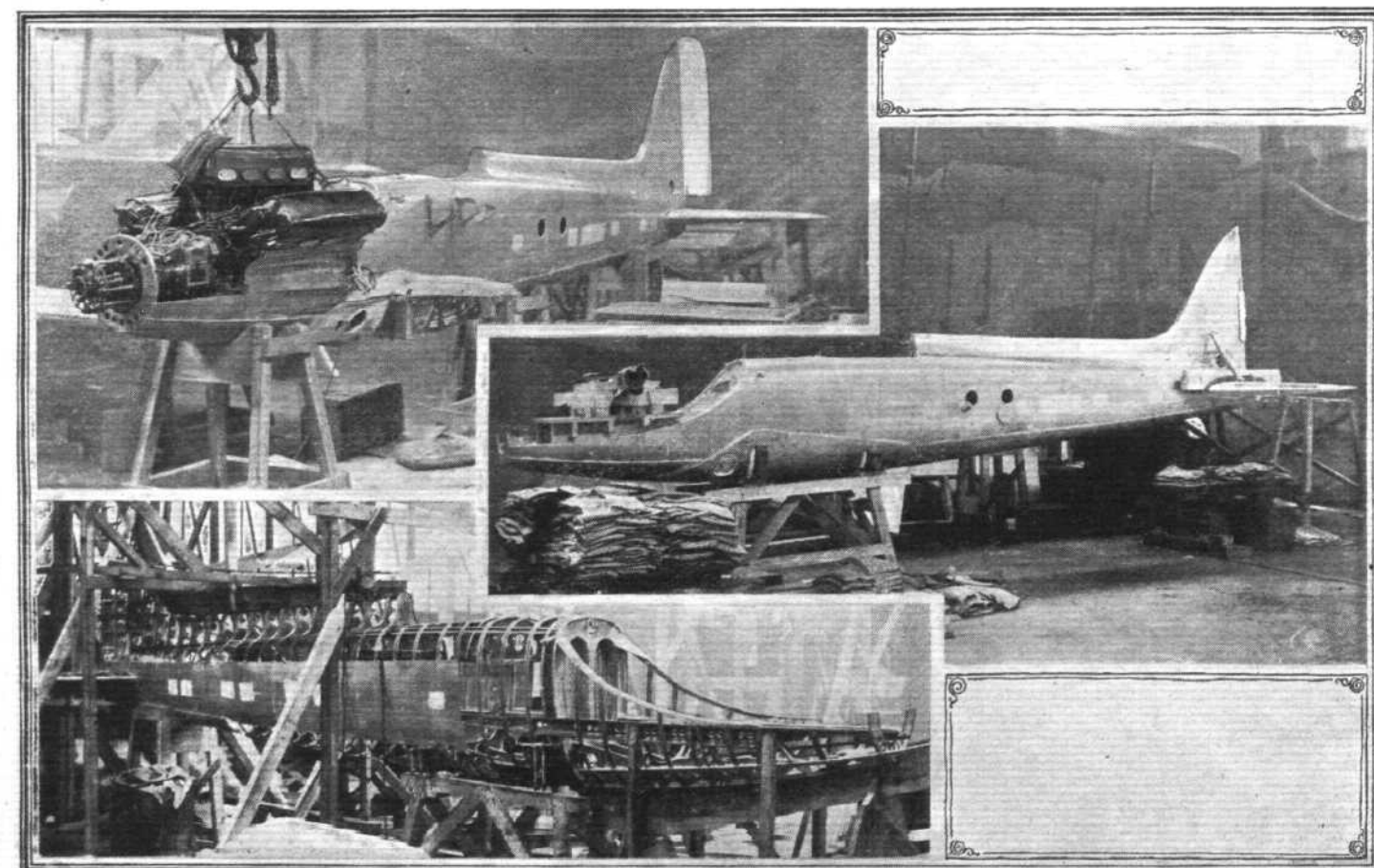
where η is the propeller efficiency, C_w the drag coefficient, V the speed in km./hour, F the wing area in square m. and N the brake horse-power of the engine. The brake horse-

power of the Napier engine may be assumed to be 875 h.p. The wing area of the S.5 is 115 sq. ft. = 10.68 sq. m., and if we assume a top speed of 300 m.p.h. (484 km./hr), a figure which is probably somewhere very near the actual speed on a straight-line course without previous diving, we obtain a value of the "High-speed Figure" of

$$\frac{484^3 \times 10.68}{56,000 \times 875} = 24.8$$

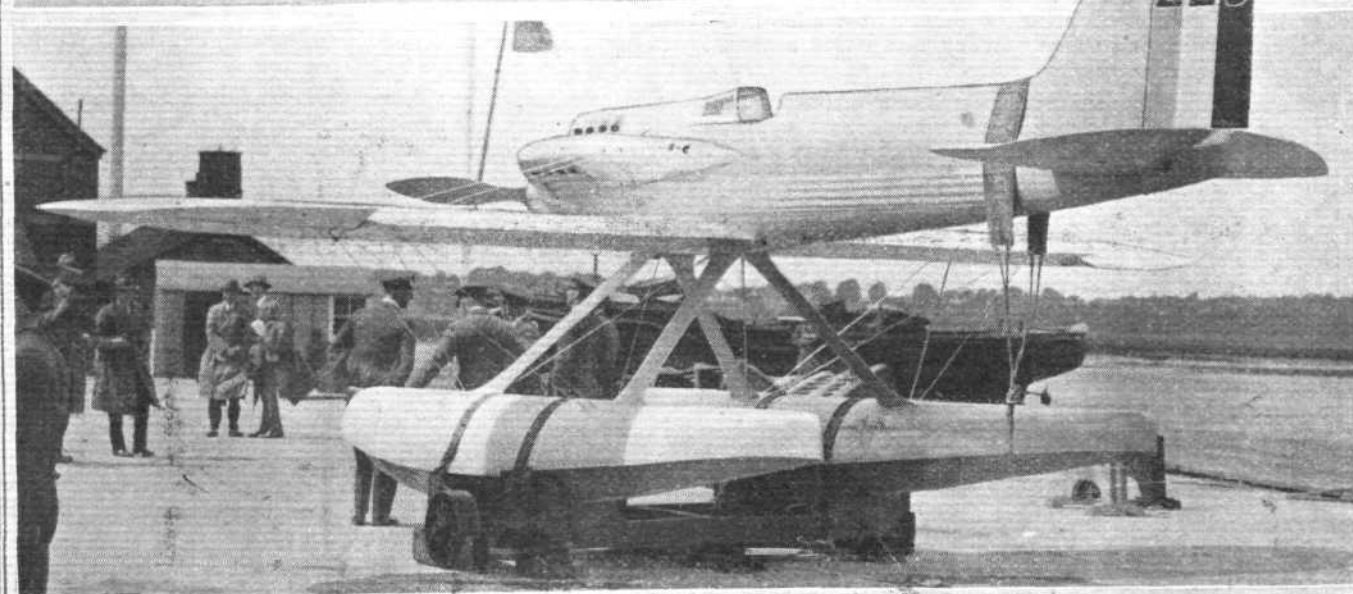
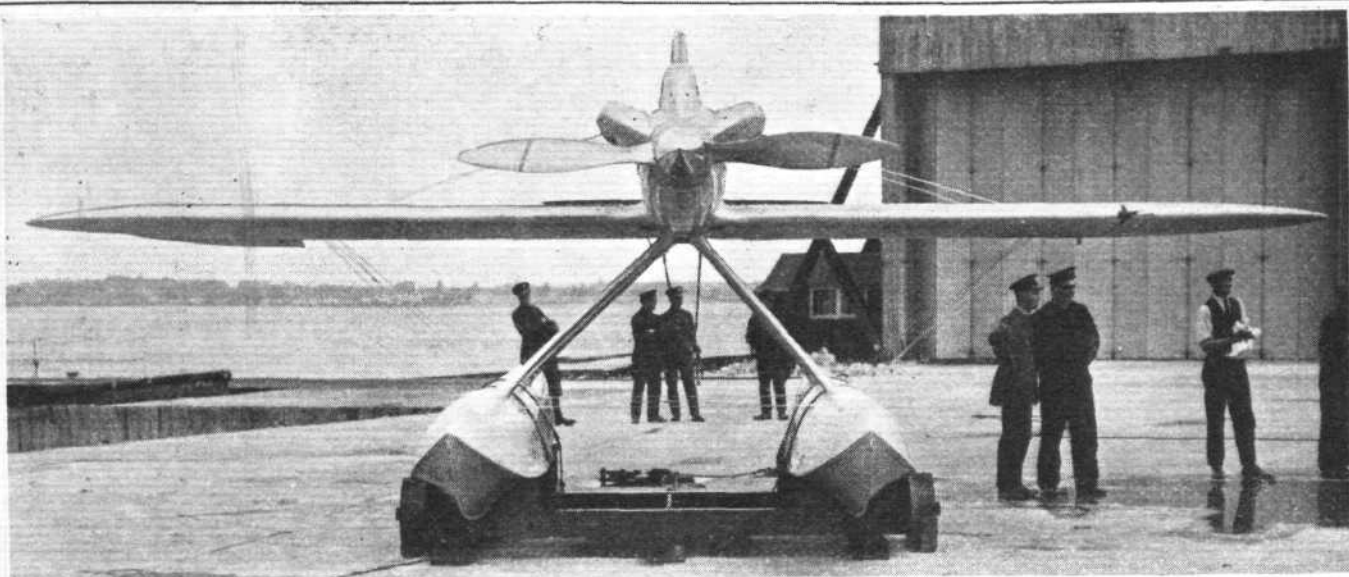
This figure, of course, represents propeller efficiency divided by drag coefficient, and in the absence of accurate information concerning the sort of efficiencies that obtain in the actual machine we are again compelled to make the best guess we can. Probably 80 per cent. would be somewhere near the mark, and if this is assumed as the value of η , the drag coefficient of the whole machine at top speed is 0.032. As the German coefficients are twice the value of ours, we obtain a drag coefficient, in British "absolute" units, of 0.016. Admittedly we have had to "guess" several of the figures upon which this value is based, but probably it is at least approximately correct. When it is remembered that the machine is a seaplane, and that therefore the float undercarriage must offer considerably greater drag than a land undercarriage, this low value of the drag is very remarkable.

In this connection it is not without interest to compare the S.5 with the de Havilland "Tiger Moth" described and illustrated in *FLIGHT* of September 22, 1927. That machine has a "wing power" of 18.3 h.p./sq. m. (1.7 h.p./sq. ft.) and, at 186.5 m.p.h. (the speed which gained the "Tiger Moth" a world's record in its class) its "High-speed Figure" is 26. If we assume the same propeller efficiency, i.e., 80 per cent., the "absolute" drag coefficient of the "Tiger Moth" at top speed is 0.0154, which is very slightly lower than that of the S.5. The "Tiger Moth" is, however, a land machine, and has an undercarriage of particularly low drag. The comparison is also interesting in demonstrating how the "Everling Quantities" do serve to show, at least in a general



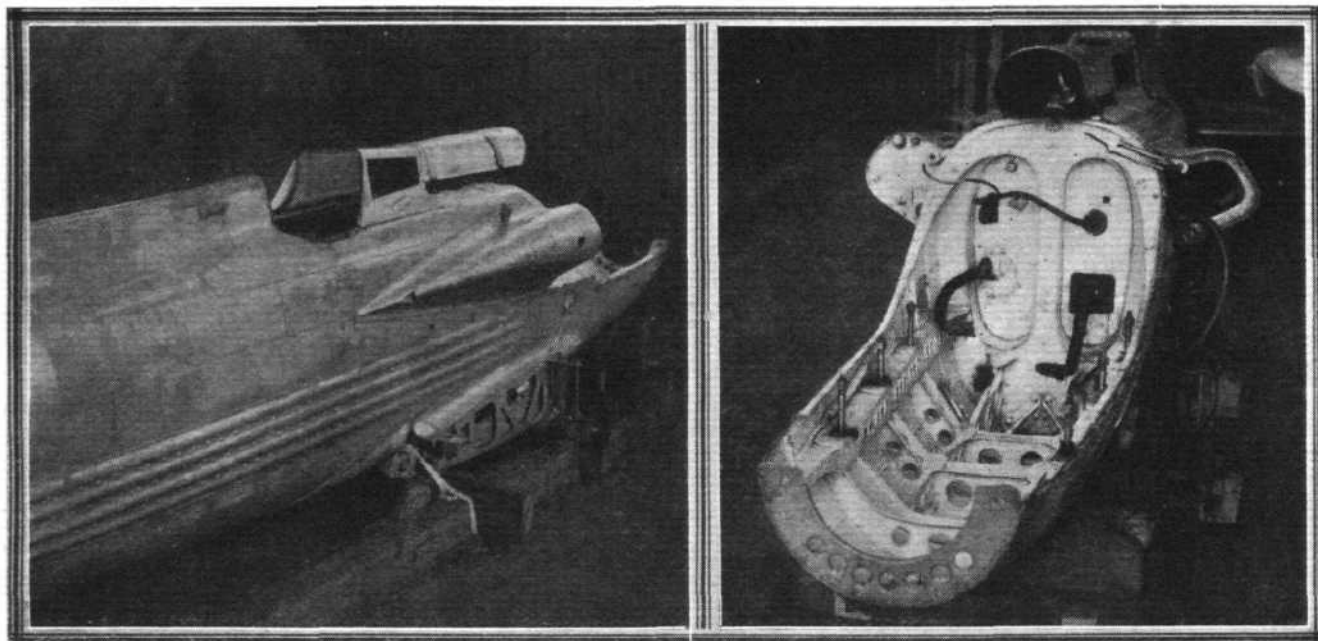
THE SUPERMARINE S.5 : Three views of the all-metal fuselage. The lower photograph shows it in skeleton. In the centre the fuselage is seen undergoing sand loading test, and in the upper picture the Napier "Lion" racing engine has been dropped into place. Note the supports for the cylinder block fairing.

TO ATTEMPT THE WORLD'S SPEED RECORD



["FLIGHT" Photographs

THE SUPERMARINE S.5 : These three views give an excellent idea of the clean lines of the machine. Note particularly how neatly the Napier "Lion" racing engine is faired into the fuselage.



THE SUPERMARINE S.5 : On the left, a three-quarter rear view of the fuselage, showing wind screen and cylinder block fairings. On the right, a view inside the engine cradle.

way, the efficiencies of machines of widely differing power (the S.5 of about 875 h.p. and the "Tiger Moth" of about 130 h.p.)

Concerning the features of design which enabled this low drag to be attained, Mr. Mitchell gave in his lecture previously referred to the main changes as between the S.4 and the S.5, and the gain in speed which he attributed to the various changes. As these figures were given in *FLIGHT* of February 2, 1928, it is not proposed to repeat them here. The photographs published on p. 95 will serve to show how small are the frontal areas of fuselage and floats in the S.5, and these and other illustrations give an idea of the care taken in streamlining unavoidable projections, and in fairing the various surfaces into the fuselage. The brief specification at the end of these notes contains the main available data relating to the machine and it is of interest to note that the "Wing Power" is the highest of any machine ever described in *FLIGHT*, being no less than 7.6 h.p./sq. ft. (81.7 h.p./sq. m.).

Constructional Features

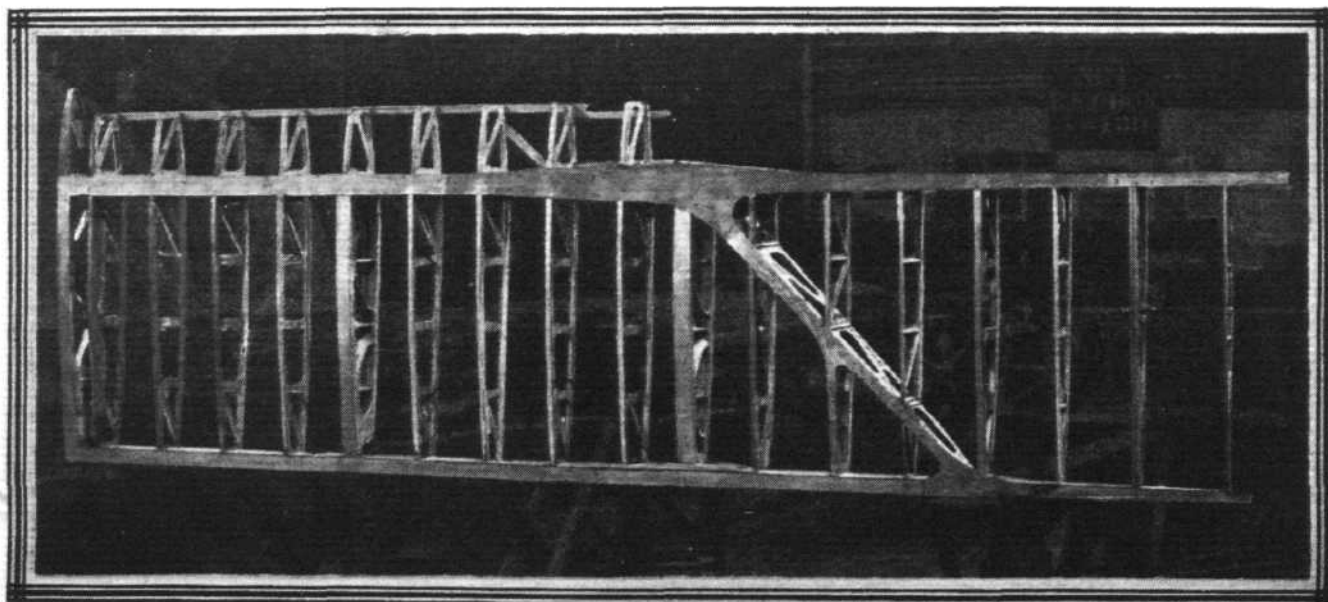
Although in a pure speed machine like the S.5 the aerodynamic design is perhaps the more interesting, there are a number of constructional features which are somewhat unusual, and which were developed as a result of the special conditions to be met with in a high-speed machine.

The fuselage of the S.5 is built entirely of metal, chiefly Duralumin, and an examination of the photograph of the fuselage in skeleton will show that by using this material

and making the body more or less a *monocoque*, a good deal of space was saved so that it became possible to keep the cross-section down to a minimum. In fact, the pilot sits on the floor, and as his shoulders touch the metal skin of the fuselage the only space lost is represented by the thickness of the Duralumin skin! The method of building up the fuselage is fairly clear from the photograph. Closely-spaced frames or formers of flat U-section give the form of the fuselage from point to point, while the skin is made to serve in the capacity of longerons, *i.e.*, is a part of the stress-resisting structure, reinforced here and there by fore-and-aft stringers.

In the forward portion there are specially strong frames for the support of wing roots, undercarriage struts and, at the top, for the attachment of the anti-lift wire bracing. The reason why the latter point is one of great importance in the design is that with the system of bracing used, this point serves to stabilise the bracing of the whole machine, floats as well as wings. The location of this "key point" may be seen in the photographs, and details of the fittings etc., are shown in a sketch.

The front bottom portion of the fuselage is built up as an engine bearer, with two main bearers of box section secured to cradles. In this region, as well as between the spar frames, the Duralumin plating is laminated so as to give extra strength, a maximum of three thicknesses of 18 G. being required in places. With the scoop-formed engine



Photograph of one wing of the S.5. Note the diagonal member which stiffens the wing tip against torsion.

mounting used, the engine becomes very accessible, as three of our photographs show.

The two floats are also of all-Duralumin construction, with the exception of the centre-section of the starboard float, which is made of steel so as to support the main petrol tank, which is situated here. The floats are of the single-step type, and have single central longitudinal bulkheads to which are attached the transverse frames, spaced some 2 ft. apart. A number of longitudinal members are fitted between the frames.

The controls are of perfectly normal type, and there is no form of variable gearing except the slight amount introduced in the ailerons by the forward angle of the aileron cranks. In spite of this the machine is reported to be relatively easy to handle in so far as a machine flying at somewhere in the neighbourhood of 300 m.p.h. can be called "easy."

Owing chiefly to lack of time in which to produce an all-metal wing, the wings of the S.5 are of wood construction. Doubtless a certain amount of experimentation would have had to be done before an all-metal wing could be produced, and to save time the well-tried and proved wood construction was adopted. The two wing halves of the machine are built on the normal two-spar principle, with ribs of normal type except for the somewhat unusually wide flanges necessary in order to secure the screw fixings of the wing radiators. From the bracing wire fittings to the tip of the wing there is a diagonal member introduced, the function of which is to stiffen the wing tip against torsion and thus reduce the chances of wing flutter being set up. The wing covering is $\frac{1}{8}$ in. three-ply, and over this are placed the radiators which are of the wing-surface type and have a perfectly smooth exterior. The radiators form a large percentage of the total wing surface, and when it is remembered that the average wing loading is 28 lbs./sq. ft., which may be increased to 2 G. or more during rapid turns, etc., while the local loading may in places reach a much higher figure still, it will be realised that to design radiators of low weight and yet subject to such great loads was no easy task. It is not possible to give details of the radiators ultimately evolved, and which gave no trouble whatever, beyond stating that they lie snug against the wing surfaces, and are divided into top surface and bottom surface units, the method of feeding them from the header tank being illustrated by sketches. The wing section is a bi-convex (symmetrical) one of medium thickness.

Bracing of the wings is, as already mentioned, entirely by streamline wires, the top point of the fuselage deck fairing

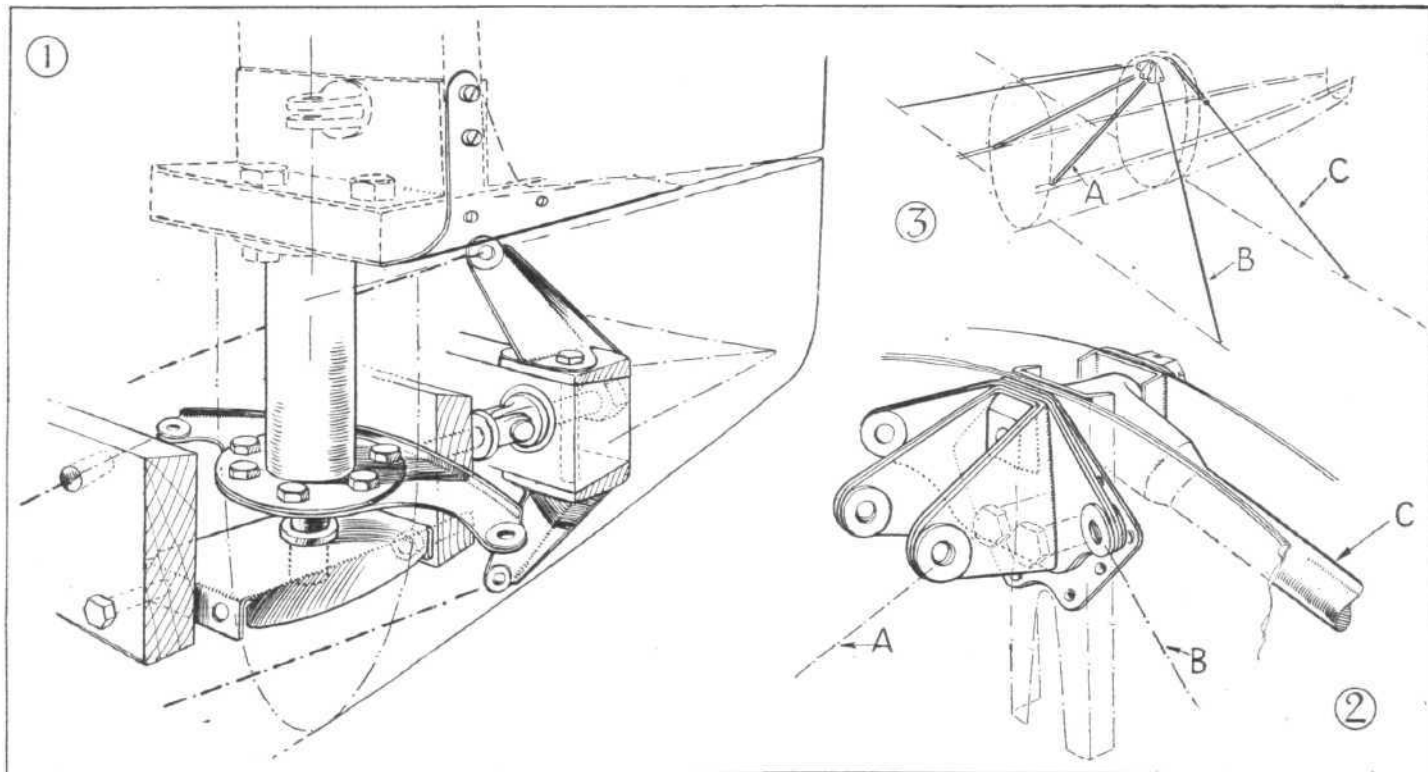


THE SUPERMARINE S.5 : The tail of the Schneider Trophy Winner. The control cranks are inside the stern portion of the fuselage.

serving to stabilise the whole bracing system of wings and floats.

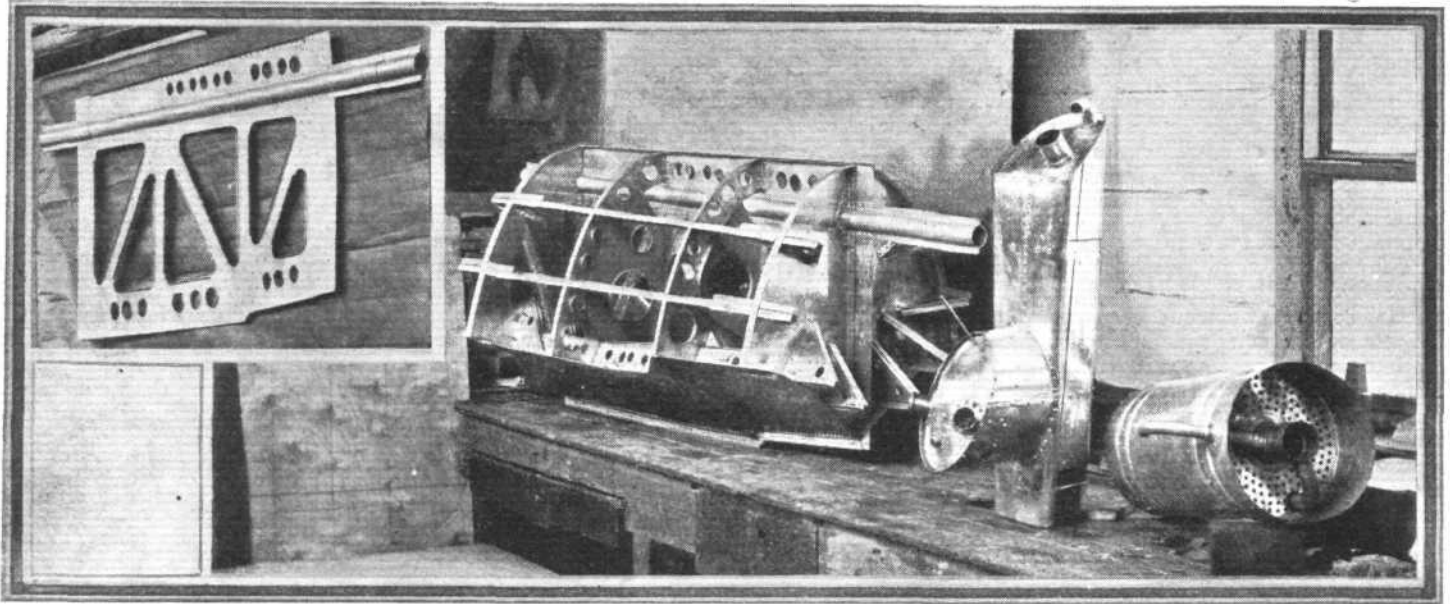
Petrol, Oil and Water Systems

With a fuselage of such very small cross-sectional area, the subject of petrol system, and also to some extent oil and water system, became somewhat of a problem. It was found that there would be no room in the fuselage for a petrol tank, and ultimately it was decided to place the main tank in the starboard float. This has the advantage of lowering somewhat the centre of gravity of the machine, and also the offset load on the starboard side helped to counteract engine torque both when accelerating on the water and in flight. The distance the petrol had to be lifted was, however, such



["FLIGHT" Copyright Sketches]

THE SUPERMARINE S.5 : 1, Details of rudder and elevator cranks inside stern of fuselage. The elevator crank is offset to clear the rudder post. 2, the fittings at the top of the fuselage to which are anchored the anti-lift wires. This point stabilises the entire bracing system. 3, diagrammatic perspective view of two main frames, with bracing wires and tubes, engine bearers and engine mounting.

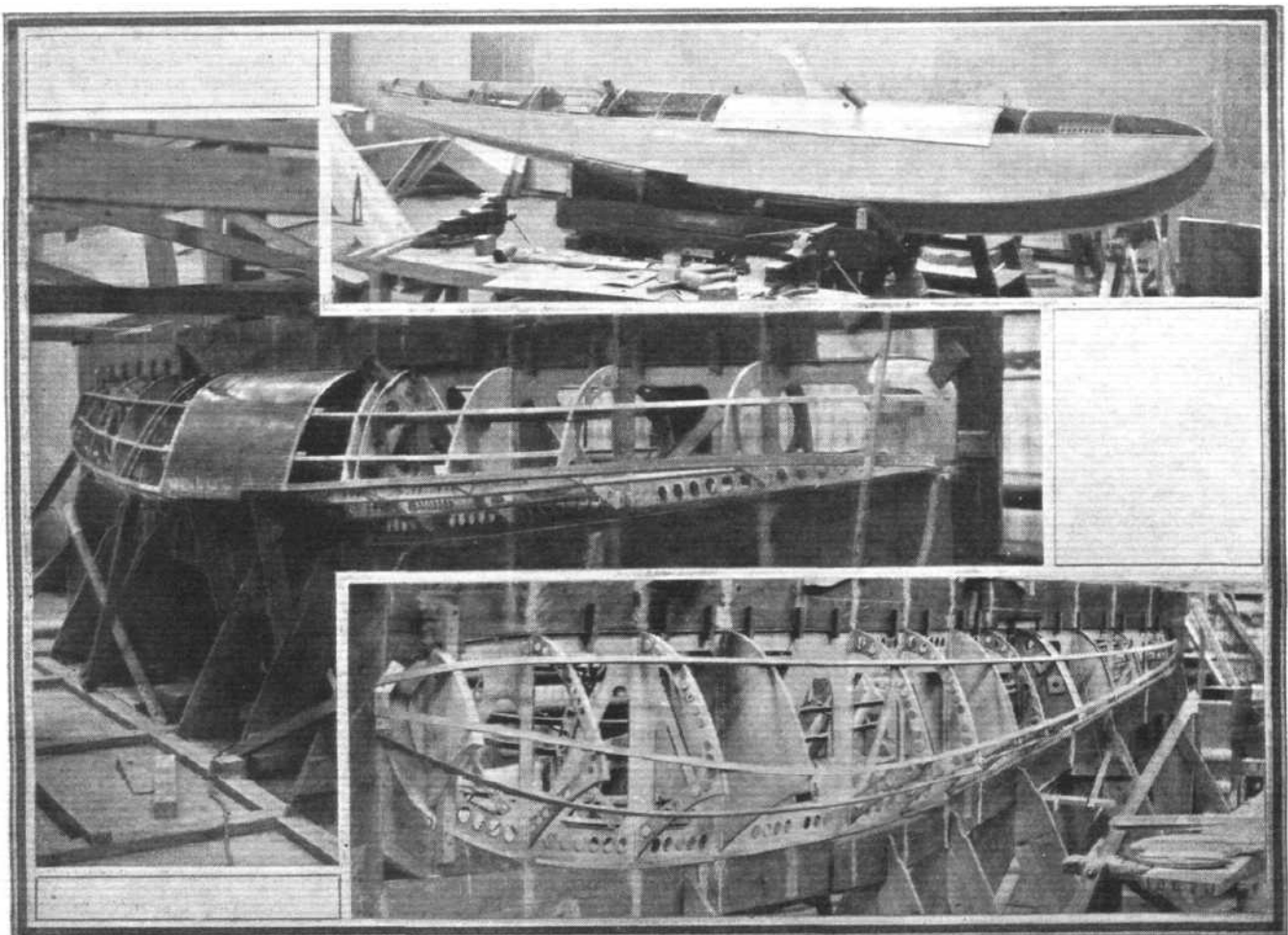


THE SUPERMARINE S.5 : The steel centre portion of the starboard float, which forms the petrol tank. Standing on end is the water header tank, and on the right the oil tank. The small inset shows a section of the central bulkhead of the steel portion of the float.

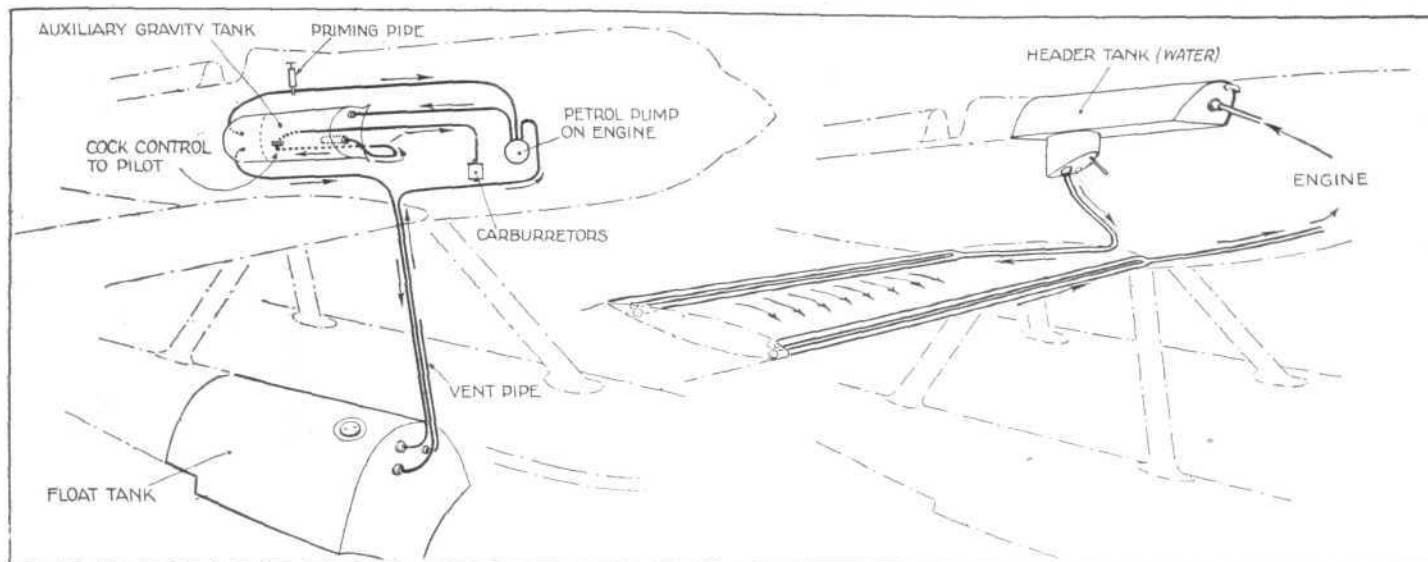
that although in normal straight flight the petrol pump could handle it, during a steep turn, with centrifugal force increasing the virtual distance, the engine would be momentarily starved, and so a small service tank was placed in the fairing behind the starboard cylinder block. Thus during a turn the engine takes its petrol from the small tank, the straight leg of the Schneider course giving the pump an opportunity of filling this tank from the float tank before the next turn was reached. The actual petrol system is diagrammatically illustrated by a sketch. The petrol capacity, by the way, is 55 gallons.

Not only because of the high speed at which the Napier

"Lion" racing engines were run in the Schneider Race, but also on account of the propeller gearing in the winning machine, which naturally called for efficient lubrication, bearing in mind that frictional losses in the gears must have amounted to a good many horse-power, the oil system of the S.5 required rather close attention, and the normal disposition was not regarded as being sufficient. Consequently, the oil coolers were arranged along the sides of the fuselage, where presumably they would be in the slipstream and always getting a good supply of fresh cool air. Whether that position is the best possible is, perhaps, open to doubt, since it would



THE SUPERMARINE S.5 : Three views of a float, in skeleton, with the petrol tank installed, and finished, except for the deck planking.

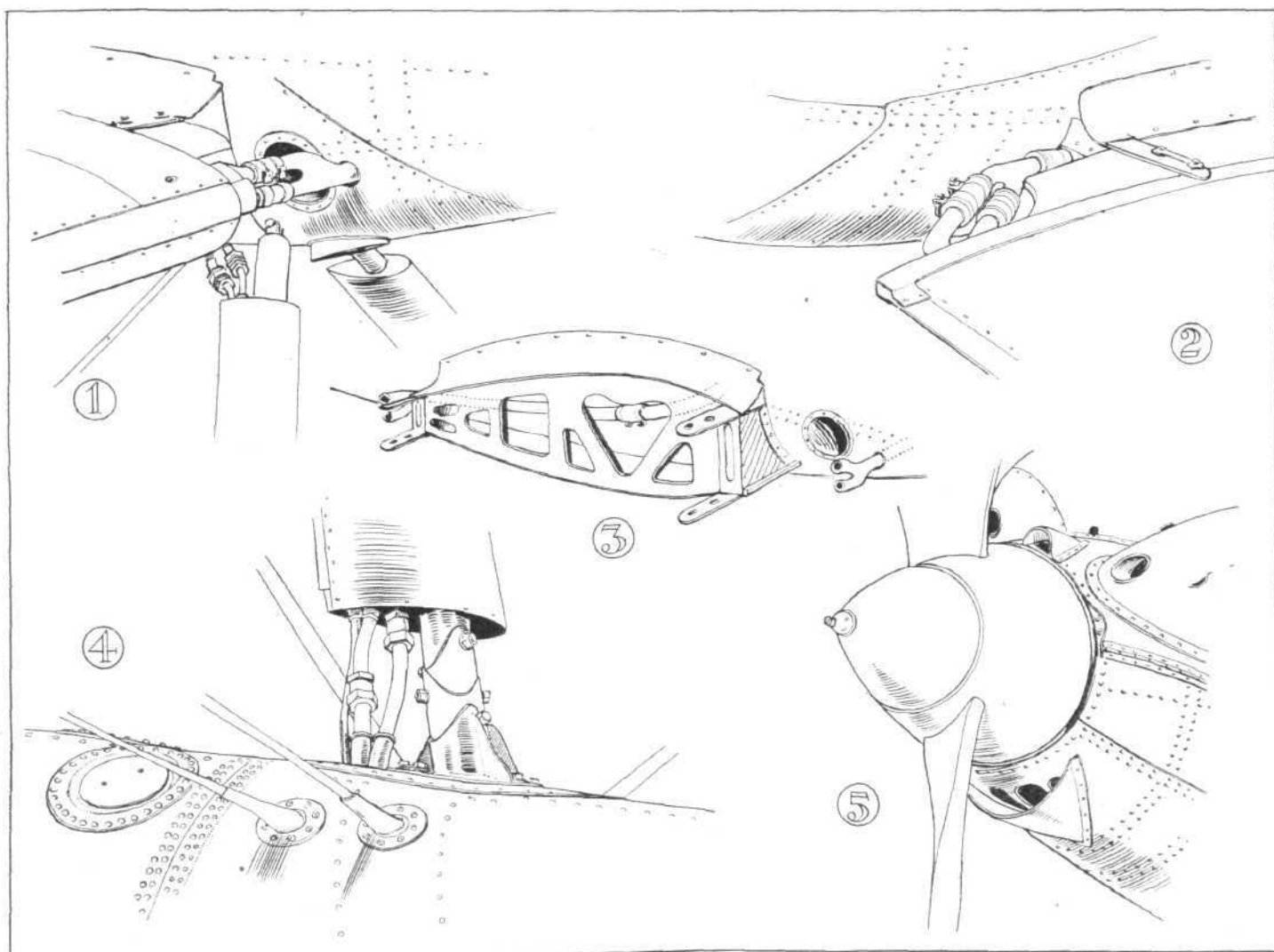


THE SUPERMARINE S.5 : On the left, a diagrammatic perspective view of the petrol system, and, on the right, a similar representation of the water system.

seem likely that the air does not follow smoothly the surface of the fuselage but is considerably churned up and also already heated to some extent by passing over the engine. Be that as it may, that was the arrangement chosen, and in the geared engine machines further cooling of the gears was

obtained by cutting openings in the cowlings over the cylinder blocks.

The water system is, chiefly due to the use of wing radiators, somewhat unusual, although not by any means particularly complicated. The water header tank is in the fairing behind



["FLIGHT" Copyright Sketches]

THE SUPERMARINE S.5 : Some constructional details. 1, Water pipes in leading edge from wing radiators. Note also petrol pipes from float in strut fairing. 2, the water pipes from the trailing edge enter the fuselage at the wing root. 3, the starboard wing root. Note the water pipe inside. 4, details of the float strut and petrol pipes where they enter the starboard float. The filler cap of the tank is also shown. 5, propeller boss, spinner and air scoops for cooling the engine gear.

the central cylinder bank, and the water is led to the trailing edge first, there dividing into two branches, of which one goes to the top surface radiator and one to the lower surface. After passing through the radiators the water emerges at the inner end of the leading edge and thence to the engine.

The main characteristics of the S.5 which it is permissible to give are as follows:—

Wing span ..	26 ft. 9 in. (8.15 m.)
Wing chord ..	5 ft. 0 in. (1.525 m.)
Wing area ..	115 sq. ft. (10.68 sq. m.)

Weight fully loaded	3,242 lb. (1,475 kg.)
Wing loading ..	28.2 lb./sq. ft. (138 kg./sq. m.)
Fuel (55 gallons) ..	380 lb. (172.6 kg.)
Oil (5 gallons) ..	50 lb. (22.7 kg.)
Pilot ..	170 lb. (77.3 kg.)

Everling "high-speed figure" (metric) .. 24.8

For obvious reasons performance figures cannot be given. Sometime in March the S.5 will be tested over Southampton Water over a measured course, when it is hoped that it will beat the world's record established by de Bernardi.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

THE COMMITTEE

REPORT of meeting of the Committee of the Royal Aero Club, held on Wednesday, February 8, 1928, at 5 p.m.

Election of Members.—The following new members were elected:—

Arthur Barron.
George Gordon Black.
Wing-Comdr. Vivian Gaskell Blackburn.
Bertram Sidney Cannell.
Roy Chadwick.
Lester D. Gardner.
Ivor Herbert McClure.
George Leslie Morrow.
Charles Keith Chase.
Stewart John Burt.

Aviators' Certificates.—The following aviators' certificates were granted:—

8207 John Harold Walton Wilcox, Nottingham Aero Club.
8208 James Charles Sleigh, Suffolk Aeroplane Club.
8209 John Swires Ellison, Yorkshire Aeroplane Club.
8210 Derek Arthur Rivers Cripps, Hampshire Aeroplane Club.
8211 Arthur Rowland Thomas Kirby, Hampshire Aeroplane Club.
8212 Henry Arthur Hallam, Nottingham Aero Club.
8213 Cyril Harry Sands, Nottingham Aero Club.
8214 Ronald Edwin Henry Caldecott, Lancashire Aero Club.
8215 Sydney Elmer Schofield, Suffolk Aeroplane Club.
8216 Henry Seely Whitby, Nottingham Aero Club.

Honorary Members.—The following temporary honorary members were re-elected for the year 1928:—

Maj. H. R. Harmon (U.S.A.).
Capt. William C. Watts (U.S.A.).

Comdr. Robert D. Kirkpatrick (U.S.A.).
Sqdn.-Ldr. A. Kubita (Czechoslovak).
Lieut. J. Bos (France).
Gen. R. Nob. Verduzio (Italy).
Capt. Koichi Shiozawa, D.S.O., I.J.N. (Japan).
Henri F. Martin (Switzerland).

Sub-Committees.—The report of the Racing and House Committees were received and adopted.

Handicapping by Formula.—It was decided to hold a special meeting of the Committee on Wednesday, February 15, 1928, at 2 p.m., to meet the Committee of management of the Society of British Aircraft Constructors to discuss the question of handicapping by formula.

Britannia Trophy.—The consideration of the award of the Britannia Trophy for the year 1927 was deferred till the Committee meet in March.

General Council of Associated Clubs.—The report of the conference held on January 18, 1928, was received.

Memorial Tablet to James Sadler.—It was decided to contribute £5 5s. towards the cost of a memorial tablet to be erected in St. Peter's Church, Oxford, to James Sadler, the first English aeronaut.

Monthly House Dinner.—The Royal Aero Club will hold a monthly house dinner on Wednesday, February 29, 1928, at 7.30 p.m. Lord Thomson will preside, and Rear-Admiral Murray F. Sueter, M.P., will open a discussion on "The Influence of Aircraft on Naval Strategy." The accommodation is limited to 60, and members are therefore requested to make early application. Morning dress.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

NOTICES TO AIRMEN

Position Reports

1. The following instructions came into force with effect from February 1, 1928.

2. Aircraft fitted with wireless, when flying along the recognised air routes mentioned below, are, under normal circumstances, only to report their position by wireless to the appropriate ground station when over the points enumerated. Should an aircraft not pass exactly above one of these points, it will report to the ground station when it has passed near the point in question.

Air Routes and Reporting Points

London—Paris: Biggin Hill, or, in bad weather, Edenbridge or Chelsfield.
English Coast, Continental Coast, Abbeville, Beauvais.
Paris—Basle: Romilly, Chaumont, Luxeuil.
London—Brussels—Cologne: London—Continental coast as for London—Paris route. Franco-Belgian frontier. *Brussels. Belgo-German frontier.
* Passage above places indicated by italics is reported only on non-stop flights.
London—Amsterdam: London—Ostend; Ostend—Amsterdam: London—Continental coast as for London—Paris route. Belgo-Dutch frontier. Rotterdam.
Paris—Cologne—Berlin: Crepy-en-Valois, Laon, Franco-Belgian frontier. Belgo-German frontier. Cologne, Teutoburgerwald, Hanover.
Paris—Lyons—Marselles: Sens, Dijon, Lyons, Valence, Avignon.
Paris—Brussels—Amsterdam: Compiègne, Franco-Belgian frontier. Brussels. Belgo-Dutch frontier.
Paris—Strasbourg—Prague—Warsaw: Villeneuve-lès-Vertus, Nancy, Strasbourg, Stuttgart, Nuremberg, German-Czech frontier, Prague, German-Czech frontier, Breslau, Polish-German frontier.

Amsterdam—Hamburg—Copenhagen: Dutch-German frontier. Hamburg. Fehmarn (arrival), or Laaland (departure).
Amsterdam—Hanover—Berlin: Dutch-German frontier.
Amsterdam—Essen: Hanover, Dutch-German frontier.
Rotterdam—Duisberg: Dutch-German frontier.
Berlin—Erfurt—Stuttgart—Zurich: Erfurt, Stuttgart, German shore of Lake Constance.
Berlin—Zurich (non-stop) Erfurt, Ansbach, German shore of Lake Constance.
Berlin—Dresden—Prague—Vienna: Dresden, Czech-German frontier, Prague, Czech-Austrian frontier.
Berlin—Breslau—Vienna: Breslau, Czech-German frontier, Brno, Czech-Austrian frontier.
Munich—Zurich: German shore of Lake Constance.
Frankfurt—Basle: None.
Basle—Brussels: Strasbourg, Luxembourg, Namur.
Geneva—Marselles: Culoz, Avignon.
3. An amendment to the appropriate section of the Revised Appendix to the Air Pilot will be made in due course.
(No. 8 of 1928.)

Croydon Aerodrome: Dangerous Slope

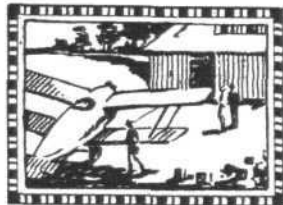
Pilots are warned to exercise great care when taxiing on the apron of the new terminal block at Croydon, as there is a slope of approximately 1/80 running downwards in a S.W. to N.E. direction. There is considerable danger of machines getting out of control, particularly in wet weather, when there is liability to lose directional control through skidding.
(No. 9 of 1928.)

Fleet Air Arm Courses

The initial instruction of naval and marine officers attached to the Royal Air Force will take place at the R.A.F. training base, Leuchars, and not at No. 1 Flying Training School, Netheravon, as hitherto. New courses will commence at Leuchars on February 29, June 12, and September 25. The following arrangements have been made for the next Naval Observers' course.

PART I.—Visual Signal Course, H.M. Signal School, April 16-May 4. Senior Officers' Technical Course, May 7-11. W/T Course, H.M. Signal School, May 14-June 8. And Gunnery Course, H.M.S. Excellent, June 11-29.
PART II.—R.A.F. School of Naval Co-operation, commencing July 18. Officers will be accommodated in the R.N. Barracks until the completion of the W/T course on June 8, in H.M.S. Excellent until June 29, and at the R.A.F. School of Naval Co-operation from July 18.

PRIVATE



FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

PRIVATE FLYING IN SOUTH AFRICA

Lady Heath's Experiences

[We have received from Lady Heath (Mrs. Elliott-Lynn) a long and most interesting account of her present visit to South Africa, which informs us how private flying and club flying are progressing in that country. We think that the importance of the subject and the interest it will inevitably arouse in all private owners and club members in this country warrants the publication of most of this information. This means that it must appear in parts, and in this issue we start with the story of Lady Heath's arrival and the welcome she received from aviation enthusiasts, to whom flying is only in its earliest infancy.—ED.]

Arrival in South Africa

ON December 6 Lady Heath and Sir James Heath arrived at Cape Town from England. Numerous wireless messages greeted them when still on the voyage from the Aero Clubs of South Africa, conveying a welcome and offering a hangar, transport, and the services of many mechanics who were eager to get at her Avro "Avian" to put it together. Col. Henderson flew over the ship early in the morning of its landing, and Lady Heath said that it was a splendid thing for them that he had arrived a few days before from England and thus more or less paved the way.

Among those who welcomed them were Col. Beatty, Secretary of South Africa's Aero Club, and the Cape Town Club's President, Mr. Sibbett, and Committee. In the afternoon they motored to Wynberg, about six miles from Cape Town, where the local aerodrome is situated. Lady Heath's "Avian" was already there in its packing case. The aerodrome is named "Young's Field," and it is just a big field with cattle in one corner and the Club's hangar in another, sheltered by trees. In the open were Major Miller's D.H. "Moth" and Col. Henderson's three "Avros" pegged to the ground. The packing cases in which these machines had arrived from England had been made into very efficient stores, accommodating Avro wings, Renault spare parts, and petrol and oil tins. They found here Col. Henderson's second pilot, Mr. Davenport, and Mr. Oldmeadow, as well as his ground engineers, who included a couple of natives. The

country looked ideal for flying, for even round the towns there were scores of fields and open spaces, and when the sun shone, as it usually did, visibility was 70 to 80 miles at least.

The acquaintance of Miss Dorys Oldfield, the fiancée of Lieut. Bentley, who flew from London to the Cape last year, was made, and Lady Heath promised her the first flight in the "Avian." When the machine (which has an extra petrol tank fitted, situated right behind the engine without interfering with the passenger, and also an extra oil tank) was erected, Col. Henderson tested it, and then Lady Heath and Miss Oldfield made a flight and incidentally overtook a train in which was Mr. Brian Russell, who went out on the same boat from England to join the Aircraft Operating Company in Northern Rhodesia.

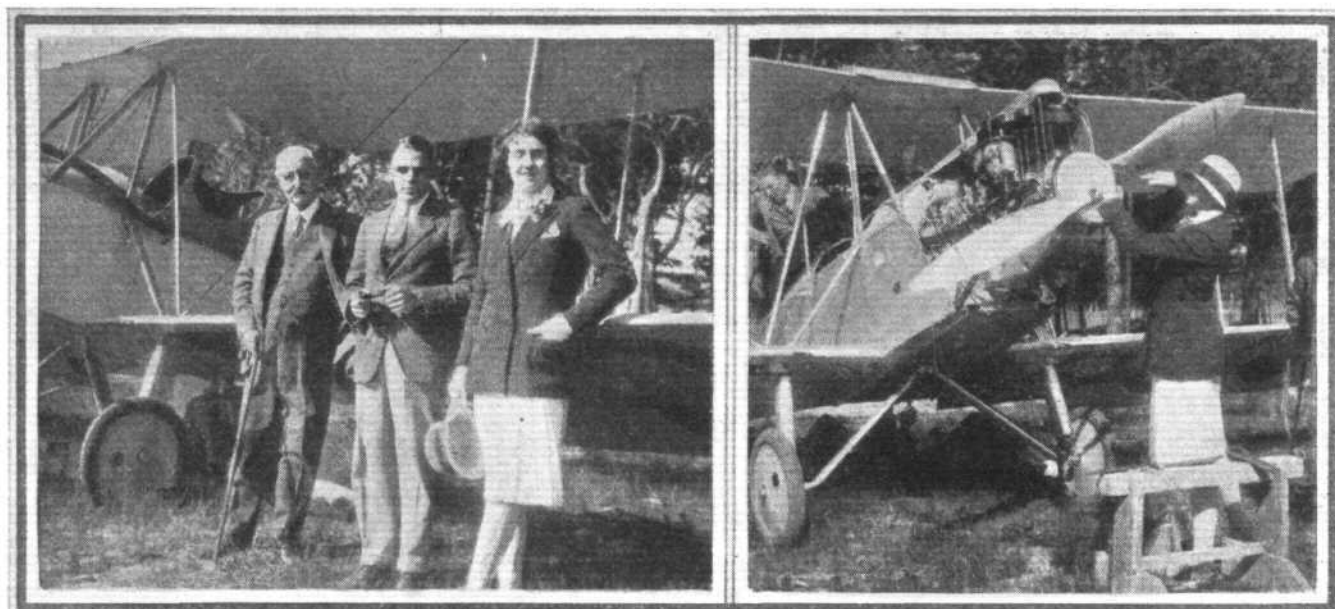
Cape Town's First Air Meeting

On December 11 Cape Town had its first Civil Flying Meeting. Although rain fell in the afternoon, there was an enormous crowd (for Cape Town) of 8,000 present. Over 900 cars were parked. Col. Henderson's machines took up 200 passengers, and Major Miller's D.H. "Moth" and Lady Heath's "Avian" plied hard all the time to make money for the Club. Most of Lady Heath's passengers were girls of 15 to 25 years of age, all of whom seemed very enthusiastic. Col. Henderson staged a race which was supposed to be round a 10-mile course, but was actually more like thirty. The Renault Avros had a long start, and were followed by Major Miller's "Moths," flown by himself and Mr. Smart, a member of the Club, respectively. The "Avian" had to give them about 25 secs. start, and so did not succeed in catching any of them. A very fine exhibition of ground chasing was finally given by Major Miller, who, says Lady Heath, practically lives in the air, and is doing a tremendous amount of work for aviation in the country.

The next item of interest in the visit was a lunch given by Mr. S. Sibbett, the Club's President, in the visitors' honour, at which the Lord and Lady Mayoress were present, and among the interesting people met were Sir Lionel and Lady



AN "AVIAN" IN SOUTH AFRICA: In this interesting group discussing the unpacking of Lady Heath's "Avian" at Cape Town will be noticed Sir James Heath (with walking stick) and Lady Heath, whilst stroking the glossy neck of the horse is Col. Henderson. The lady rider is Miss Jute, of Johannesburg, who learned to fly with Col. Henderson and was ready to go solo within a week.



SNAPSHOTS FROM SOUTH AFRICA : On the left are Lady Heath, Mr. Brian Russell and Sir James Heath, standing before the former's Avro "Avian," which was in course of erection at Young's Field, the aerodrome outside Cape Town. On the right is Lady Heath tightening up the propeller, whilst other energetic workers are seen under the machine and in the rear cockpit.

Phillips, Sir Drummond and Lady Chaplin and General McKineny.

Opposition to Sunday Flying

Following the air meeting, which was held on a Sunday, a long and fierce discussion was waged in the Press on the question of Sunday flying, and Lady Heath says it was probably the cause of the great success of the second meeting when nearly as many people attended. The day was full of incident. With Col. Henderson she was invited to lunch by the Stewards of the Milverton racecourse, 15 miles from Wynberg. The hosts had forgotten, however, to point out that an electrical starting-gate spanned the track opposite the grand stand. Col. Henderson made some gliding turns as he came down before the imposing crowd, but suddenly when about 15 ft. up, six strong wires were struck and the Avro sat down on them, leaving the 4-in. diameter steel gatepost, which was set in concrete, nearly doubled and the wires astray. Strangely enough, no damage resulted to the machine. Col. Henderson had skilfully brought it to rest on the wires, instead of risking an attempt to fly under or over them. Incidentally, says Lady Heath, Col. Henderson's appetite was noticeably absent at the luncheon. After witnessing one race, they took off for Wynberg in very spectacular fashion towards the grand stand, for the situation left them with only one direction to rise in. Local journalism

described the successful feat as exhibiting "consummate skill" on the part of the pilot.

A Pilot in a Week!

Continuing, Lady Heath writes that she saw a lovely bronzed South African girl astride a well-groomed horse on the aerodrome, asking Col. Henderson if she could learn to fly. Within a week, this pupil, Miss Jute, of Johannesburg, had put in six hours flying and was ready to go solo! Unfortunately, she had to return to Johannesburg before it was possible to do so, otherwise she would have been the first South African lady to learn to fly, and created a record for her tuition period. Col. Henderson said she had never made one bad landing, and was fit to go solo after only four hours' dual flying. It was her intention to take her ticket with the Club in her own town of Johannesburg.

Col. Henderson had about 12 pupils in December, most of whom were nearly ready to fly solo. Instead of there arising any friction between his flying school and the Aero Club and flying clubs, they work together in complete harmony, and really find each other a valuable asset. Col. Henderson was reported to have said, soon after his landing, when interviewed by the local Press, that he hoped to form regular schools of flying in South Africa, and leave them in charge of South African pilots, taking his own pilots back with him to England.

PROGRESS OF THE AUTOGIRO

A New Private Flying Machine

In October, 1925, an interesting demonstration of Senor J. de La Cierva's invention, the Autogiro, was carried out at Farnborough by Capt. F. T. Courtney, in the presence of many distinguished visitors. Since then the developments of this unconventional machine have been comparatively secret, as is the case with most experimental work. That something was maturing might have been gathered by any regular reader of the Hampshire Aeroplane Club's weekly notes in our columns, for much of the actual flying tests was carried out in their vicinity, and, in fact, Senor de La Cierva became a very active member of the club, with whom he learned or re-learned to fly. His fellow members were also able to experience flights in one of his Autogiros.

This incidental association of the club with the activities of the Autogiro arose merely through the machines being constructed by Messrs. A. V. Roe and Co. at Hamble. Others were also constructed by Messrs. Parnall's, of Bristol. As a result of this co-operation with the former company, there has now been produced a machine that is practically standard. It is an "Avian" two-seater, fitted with a Cirrus II engine, and embodying the Autogiro rota in place of the fixed wings. It has been put forward now by the Cierva

Company with potentialities for private flying and club flying, at a price of £900, delivery at the Avro works at Hamble, Southampton.

It is considered by them that qualified pilots could become quite familiar with the particular features of the machine in half-an-hour and require no special training to enable them to fly it without difficulty or risk, whilst pupils would learn in much less time than usual, and with more simplicity. The risks of making mistakes had been practically eliminated.

Senor de La Cierva recently gave a lecture on his machine to the Cambridge University Aeronautical Society. He described the types that had been experimented with, and revealed the elementary features of his latest type. The ailerons, supported by two lateral spars, had been replaced by a small pair of monoplane wings in order to save unnecessary drag. A various number of blades had been tried, and their shape and pitch angle altered. The top speed of one type had been increased by nearly 20 m.p.h., and its climb with a passenger carried was much better than that obtained at the beginning, when used as a single-seater. (In the Farnborough tests of 1925, the top speed was then thought to be about 65 m.p.h., and landing speed 20 m.p.h. This increase

in top speed has been obtained, we gather, without any increase on the landing speed.)

Owing to the slow landing speed, continued Senor de La Cierva, the undercarriage had to be very wide. Many minor mishaps during the early tests were due to using an ordinary undercarriage. A four-wheeled undercarriage had been tried, but the present type had two wheels.

Explaining how to fly the Autogiro, he said that the rudder, elevator and ailerons were governed in the same way and by the same means as in an ordinary aeroplane. In some types there was, in addition, a small wheel on the instrument board which, by means of a low pitch gearing, altered the lateral angle of the mast or axis of the rota, displacing the whole lift reaction to one side or the other of the centre of gravity and so modifying the lateral trim. The instruments used for flight were the same, but with the addition of an extra revolution counter connected to the revolving wings. When the engine had been run up a mechanic set the rotating wings free, and then a pilot proceeded according to the intensity of the wind. If there was very little wind he taxied in any direction, beginning slowly and gradually accelerating until the revolution counter showed half the normal revolutions of the rotating wings when in flight. Then he taxied to a corner of the aerodrome, maintaining a good speed, and opened out.

If the wind was medium, it was preferable to run side-wind until the necessary revolutions were obtained and then turn against wind to start. In a wind of more than 25 m.p.h. the start should be made straight against the wind, accelerating very slowly. In any case, as soon as 80 per cent. of the revolutions were obtained the machine took off suddenly when the horizontal speed was still much reduced.

The best climbing speed was somewhat lower than that of the equivalent aeroplane, but the rate of climb was not very sensitive to changes in forward speed. As an example, in an Autogiro with a Clerget engine, practically equivalent to the standard Avro, the best climbing speed seemed to be anything between 45 and 55 m.p.h.

Continuing, Senor de La Cierva said that the machine should be flown as an ordinary aeroplane, although several fundamental differences would be immediately noticed. Bumps would hardly be felt, and in the worst weather it was not necessary to use the controls. The machine answered, with extraordinary obedience to the rudder, ailerons and elevator. For turning the rudder was used almost exclusively, for the machine banked automatically unless the turn was a very quick one. If the rudder was swung round suddenly without moving the stick the machine turned flat, and although the air speed dropped there was no lack of lateral control.

On landing the machine glided at any speed the stick imposed on it when the engine was throttled down. When an error of judgment had been made or the engine had stopped and a premature landing was essential, the stick was pulled right back and a vertical descent followed, with the indicated air speed falling rapidly to a negligible value. Perfect stability was maintained and the machine was still controllable. If even then a pilot was just short of his intended landing spot, a push on the stick would give the machine a forward glide, but in any case, when a few dozen feet up a pilot should put up the speed until it was about 30 m.p.h. by letting the machine glide forward, and then at a distance of between 3 ft. and 10 ft. up the stick should be pulled hard back when the nose would be raised, causing the machine to stop and then drop vertically very slowly.

The machine looked after a pilot who was incapable of judging his height when flattening out, said the lecturer, and with special undercarriages as fitted to all their experimental machines, he could come right down vertically from any height without any harm to the machine, although with a bump, of course.

A day would come when the Autogiro would have a mechanical self-starter, and then ascents would be possible from any small field; but even as it now is, the lecturer claimed that it could take off from a smaller field than the aeroplane by taxiing round the field the necessary number of times.

THE SOUTHERN AERO CLUB

THIS Club, which has its quarters at Shoreham Aerodrome, Sussex, is not so well known as other clubs, but it apparently has the unique distinction of being the only club in this country which survives without a subsidy. It has a membership of between forty and fifty, which includes many ladies, and it is able to give first-class flying instruction. It possesses good social facilities at its aerodrome. An effort is being made this summer to train a school of pilots with the hope that they will enter air competitions and bring back laurels to the club. For this purpose it is proposed to obtain more machines. The present fleet consists of five, of which three belong to private owners. The training machines are Avro 504K's. It is anticipated that more private owners will enrol. Members are encouraged to join the R.A.F. Reserve.

It was the recent fortune of the club to be presented with new premises by Tamplin and Son's Brewery, Brighton, Ltd. The opening day on February 4 was an auspicious occasion, for the Mayoress of Hove performed the ceremony and the Mayor of Hove also attended. He mentioned in his speech that it was not often he went so far from his borough to

preside at functions, but he was so impressed with the great value of aviation to the country that he felt it his duty to assist in its promotion when possible. A feature of the ceremony was the film exhibition carried out by the club with its own apparatus. The films showed various Schneider Trophy races, aviation events since the Itford Gliding meeting, and included an American film on air-fighting during the war, which was much appreciated.

This Club was opened in 1924. One of the founders was Mr. F. G. Miles, who is now Chief Instructor. The other instructor is Mr. Cecil Pashley, who was a well-known pilot before the war and was in partnership at Shoreham with his brother Eric, who was killed. The President is Comdr. Sir A. Cooper Rawson, R.N.V.R., M.P., and the secretary Mr. C. A. Boucher, who will be pleased to send full particulars of the Club on application to him at Shoreham Aerodrome.

It was intended to give the Mayor and Mayoress of Hove flights during the afternoon, but the bad weather put this out of the question. Mr. Miles went up in an Avro 504K and gave as good a display as was possible under the conditions.

Lieut. Bentley to be Married

LIEUT. R. R. BENTLEY, who flew from London to the Cape last September, is to be married to Miss Doris Oldfield on February 18. They will spend their honeymoon on a flight to Rhodesia in the D.H. "Moth" in which his long flight was made.

London-Tyneside Air Line

THE Newcastle Aero Club is reported to be considering a scheme for linking the Tyneside and London with a regular air service.

Films about Flying Exhibited

THE Cinque Ports Flying Club displayed the Air Ministry's official film, which shows the working of Imperial Airways organisation, at Hythe on February 13 and 14. Comdr. G. C. Deacon lectured at the same time, and Maj. F. W. Butler appealed to the audience to take up shares in the company that is to operate the club.

Dancing for a Clubhouse

THE Yorkshire Aeroplane Club has arranged a supper dance at the Riley-Smith Hall, Tadcaster, for Wednesday,

February 29. The tickets are 10s. 6d. each. The object to augment the clubhouse funds.

Parachute Drop from a D.H. "Moth"

THE first parachute descent from a light aeroplane was made at Letchworth on February 2. Mr. Irving, the inventor of the Irving parachute, flew his own D.H. "Moth," from which Mr. de Weiss, one of his demonstrators, made the jump. This was the first occasion that the employees of Mr. Irving's company had witnessed a descent, although they have been making parachutes for the Royal Air Force for two years.

Light Aeroplane Order for India

MR. B. LEETE ordered an Avro "Avian" (Cirrus) and a Westland "Widgeon" in this country for shipment to Calcutta, where they are expected to arrive towards the end of next month. Associated with Mr. Leete in his air interests in India is Capt. H. W. Vetch.

D.H. "Moth" for Official Use

A D.H. "MOTH" has been allotted to the Directorate of Civil Aviation.

LIGHT 'PLANE CLUBS

London Aeroplane Club, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W.1.
Bristol and Wessex Aeroplane Club, Filton, Gloucester. Secretary, Capt. C. F. G. Crawford, Filton Aerodrome, Patchway.
Hampshire Aero Club, Hamble, Southampton. Secretary, H. J. Harrington, Hamble, Southampton.
Lancashire Aero Club, Woodford, Lancs. Secretary, C. J. Wood, Oakfield, Dukinfield, near Manchester.
Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Maj. Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.
Newcastle-on-Tyne Aero Club, Cramlington, Northumberland. Secretary, A. H. Bell, c/o The Club.

Norfolk and Norwich Aero Club, Mousehold, Norwich. Manager, F. Gough, The Aerodrome, Mousehold, Norwich.
Nottingham Aero Club, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., Imperial Buildings, Victoria Street, Nottingham.
The Scottish Flying Club, 101, St. Vincent Street, Glasgow. Secretary, Harry W. Smith.
Suffolk Aeroplane Club, Ipswich. Secretary, Courtney N. Prentice, "Hazel Dell," Stowmarket, Suffolk.
Yorkshire Aeroplane Club, Sherburn-in-Elmet, Yorks. Secretary, Lieut.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.

LONDON AEROPLANE CLUB

REPORT for week ending February 12.—Flying time, 20 hrs. 50 mins. Dual instruction, 9 hrs. 5 mins.; solo flying, 8 hrs. 50 mins.; passenger flights, 2 hrs. 55 mins.

Dual instruction.—(With Capt. F. G. M. Sparks): W. L. M. O'Connor, G. E. Gotheridge, Rich Hayes, Mrs. Fraser, H. M. Samuelson, Miss Fletcher, L. Brewster, E. A. Lingard. (With Capt. S. L. F. St. Barbe): Miss Wilson, J. M. Edwards, W. L. M. O'Connor, H. B. Michelson, A. O. Wigzell, A. L. A. Petty, H. W. Marlow, S. Hansel, L. Rowson, G. E. Clair.

Solo flying: H. B. Michelson, R. Sanders Clark, C. E. Murrell, H. M. Samuelson, B. B. Tucker, E. E. Stammers, O. J. Tapper, G. H. Craig, J. H. Saffery, G. W. Hall, A. G. B. Alderson, E. E. Fresson, J. J. Hofer, W. Hay, D. H. P. Esler.

Passenger flights.—(With Capt. F. G. M. Sparks): T. E. Miller, Miss Cholmondeley, J. C. V. K. Watson, Mrs. Davis. With E. E. Stammers: Miss V. Cholmondeley. (With O. J. Tapper): Miss H. Cholmondeley. (With G. H. Craig): S. O. Bradshaw. (With A. G. D. Alderson): R. C. Presland.

BRISTOL & WESSEX AEROPLANE CLUB

REPORT for the week ending February 11.—Total flying, 9 hrs. Instruction, 5 hrs. 35 mins.; solo, 1 hr. 50 mins.

Passengers (with Mr. Tapp): Miss Johnstone and Mr. Spooner; (with Mr. Bartlett), Mr. J. E. L. Bartlett. Under instruction: Maj. Hume, Messrs. Garnett, Bryan, T. H. Clarke, Roberts, Tanner and Arnold.

Soloists: Messrs. J. E. Traiman, E. Hopper, and T. H. Clarke.

Mr. T. H. Clarke did his first solo flight this week.

Flying has been possible on three days only, and for a short time on each of those days. As this disheartening weather appears to be general throughout the country, we do not feel that we are falling behind other clubs in the matter of flying done.

HAMPSHIRE AEROPLANE CLUB

REPORT for week ending Sunday, February 12.—Flying time, 10 hrs. Instruction, 5 hrs. 45 mins.; solo flights, 3 hrs. 40 min.; passenger flights 25 mins.; tests, 10 mins.

Instruction with Flight-Lieut. F. A. Soffer: Mrs. Ranald, Mr. Lowe-Wilde, Capt. Kirby, Mr. Perfect, Mr. Shepherd, Watson-Taylor, Fawkes, Richardson, Wells, Courtney Parker, Oliver, Curtis-Nuthall, Fagan, Scott-Hall.

Soloists: Mrs. Ranald, Capt. Kirby, Bowen, Cripps, Shepherd, Wells, Lowe-Wilde, Parier, Oliver, Fagan.

Passenger (with Mr. Oliver): Mr. Oswald.

Flying was only possible on two days this week, Thursday and Sunday. On the other days there were strong westerly gales and rain. Mr. Lowe-Wilde made a successful first solo.

During this week only the Avro "Avian" was in commission, both our "Moths" are being reconditioned.

LANCASHIRE AERO CLUB

REPORT for week ending February 11.—Flying time, 12 hrs. 50 mins. Instruction, 5 hrs. 35 mins.; solo flights, 4 hrs. 40 mins.; passenger flights, 1 hr. 30 mins.; tests, 1 hr. 5 mins.

Instruction (with Mr. Baker)—Anderson, Secker, Gort, Goss, Davison, Weale, Cohen, Hall, Tweedale, Benson, Harber, Stern, Michelson. (With Mr. Cantrill)—Rowley, Meads.

Soloists (under instruction).—Caldecott, Browning, Ruddy.

Pilots.—Goodfellow, Meads, Rowley, Michelson, Nelson, Gattrill, Twemlow, Lacayo.

Passengers.—(With Mr. Lacayo): Mr. Ogden, Mrs. Ogden, Mr. Mills; (with Mr. Twemlow): Mrs. Twemlow; (with Mr. Cantrill): Mr. Faulkner, Miss Dewhurst; (with Mr. Cantrill): Mr. Alderson, Mrs. Chadwick.

Still this aircraft shortage! QL is due back in the fold this week, but RR having had all her "big-ends" put right has now got a badly-cracked cylinder, while MQ is not yet back from Shrewsbury. In any case, the weather has been almost Liverpoolian! On Tuesday, Messrs. Brown and Cantrill tried to get through to Scotland on an Avian, but were forced back by storms near the border. On Saturday, a Renault Avro got through from Southport, having taken 100 mins. to cover 40 miles, and having all the fabric stripped off the aircrew by the rain en route. Wotaylaif!

MIDLAND AERO CLUB LIMITED

REPORT for week ending February 11.—Total flying time, 6 hrs. 30 mins. Dual (with Capt. McDonough): Messrs. D. Wynn, R. Baker, H. Lattey, G. Robson.

Solo.—Messrs. H. J. Willis, S. H. Smith, E. J. Brighton, R. L. Jackson, W. Swann.

High winds again restricted flying this week.

NEWCASTLE-UPON-TYNE AERO CLUB

REPORT for week ending Sunday, February 12.—Total flying for week, 10 hrs. 5 mins. Instruction, 4 hrs. "A" Pilots, 5 hrs. 50 mins. Tests, 15 mins.

Instruction with Mr. Parkinson.—Miss Klyver, Mr. V. Heaton, Junr., Mr. E. J. Griffiths, Mr. J. E. Fairless.

"A" Pilots.—Mrs. Heslop, Mr. C. Thompson, Junr., Mr. H. Ellis, Dr. H. B. L. Dixon, Mr. D. Wilson, Mr. C. E. Shaw, Mr. A. Bell.

Passengers (with Mrs. Heslop): Mr. C. Thompson, Mr. A. H. Bell. (With Mr. C. Thompson): Mrs. Heslop, Mrs. Tinless, Mr. Luckman, Mr. Robson, Mr. Fairless, Mr. Bulmer. (With Mr. H. Ellis): Mr. A. Bell. (With Mr. A. Bell): Mr. J. Bell.

The Scottish Club's second "X" Moth arrived at the Aerodrome on Sunday afternoon, on its way north, piloted by Mr. E. A. Jones, with Mr. M. B. Barclay as passenger. Owing to lateness, the machine was parked in the same hangar as the Newcastle machines for the night.

The Club has been fortunate in securing Lord Ossulston's Moth, G-EBPT, His Lordship having ordered an X-type Moth.

A continuous gale lasted from Monday morning until Saturday night, and all the flying mentioned above was carried out on Sunday, when the wind abated at times.

NORFOLK & NORWICH AERO CLUB

FLYING report for week ending February 12.—Total flying time, 9 hrs. 55 mins.

Instruction (with Capt. Lines).—Messrs. G. Watson Parker, N. Lindley, A. A. Rice, N. Brett.

Soloists.—Messrs. W. P. Cubitt, F. Gough, C. A. Rea, R. T. Harmer.

Passengers.—Miss Edwards and Mr. A. Bagshaw.

The weather during the past week has been shocking, and yet quite a lot of enthusiastic members have braved the elements and juggled with the "joy stick."

Sqdn.-Ldr. Rea gave a very good lecture on Wednesday evening in the Club House, and the next time we have one we must hire a large hall.

We have pleasure in giving welcome to two prominent citizens this week. They are The Lord Mayor of Norwich and Sir George Chamberlain, both having joined the club. The Lord Mayor and Lady Mayoress are going to honour us with their company on the 23rd. Applications for membership continue to come in and our outwards mail is being swelled by receipts for subscriptions which is most cheering.

NOTTINGHAM AERO CLUB

REPORT for week ending February 10.—Total flying time, 6 hrs. 5 mins. Dual time, 1 hr. 35 mins. Solo (A), 2 hrs. 10 mins. Solo (under instruction), 1 hr. 25 mins. Passenger time, 30 mins. Tests, 25 mins.

Passengers (with Mr. Wilcox): Messrs. Wilcox, Wheatly and Chick. (With Mr. Ball): Mr. Pombrey. Solo, "A" Licence: Messrs. Wilcox, Hallam and Ball.

Solo under instruction: Messrs. Cox, Blake, Whitby and Sands.

Dual with Mr. Martin: Messrs. Pilgrim and Glenn.

Same old excuse about the weather. Congratulations to Wilcox on his aimedness campaign. The population of Nottingham is only about 300,000, and at the rate he is going, most of the adult population (of both sexes) will have had flights before the subsidy lapses.

Hallam has requalified for his "A," and is joining the campaign.

We regret to announce that two of our members, although over age, have contracted chicken-pox, but fortunately the habit has not spread.

SUFFOLK AEROPLANE CLUB

REPORT for week ending February 12.—Flying time, 7 hrs. 35 mins.

Instruction (with Mr. Lowdell).—Miss Edwards, Miss Creasy, S. Schofield, K. Peck, F. Verney, H. Billinton, A. Westwood, F. Jolly, R. Brown.

Passengers (with Mr. Lowdell).—Miss Rose, C. Hanson. (with Mr. Prentice): Messrs. T. Marriage, F. Dyson, B. F. Marriage, J. Lancaster, F. Jones.

Soloists.—Dr. Jas. Sleigh, S. Schofield, C. N. Prentice

After a week of rain and gales which had held up all flying and caused consternation to the Finance Committee, Sunday was a really Spring-like day, A Moth, Widgeon, Bluebirds, and various other birds arrived in full force. The aerodrome had all the appearance of a miniature display. Our President, the Hon. Lady Bailey, flew down in a Moth, Capt. Blake arrived in a demonstration Bluebird, and Mr. Penrose in a Widgeon. Formation flying, loops, rolls, spins and joy-riding attracted a number of visitors.

Forthcoming Display.—A meeting of the Display Committee was held on Sunday evening, and Mr. H. Billinton was elected Chairman, and Mr. C. Hanson, Secretary.

It has been definitely decided to hold a two-day Display on Easter Sunday and Monday, Sunday to be devoted to joy riding and exhibition flying, and on the Monday air races, bomb dropping, pageant of travel, etc.

Will all private owners and others interested kindly note the date, we shall be very grateful for any assistance in connection with this.

YORKSHIRE AEROPLANE CLUB

REPORT for week ending February 11.—Flying time, 3 hrs. 25 mins. Instruction, 35 mins.; soloists, 2 hrs. 50 mins.

Instruction (with Capt. Beck).—Mr. Clayton. (With Mr. Stockbridge) Mr. Ostler.

Soloists.—Messrs. Humphries, Ellison, A. Crowther, H. Crowther.

"A" Pilots.—Messrs. Dawson, I. Thomson.

We wish to take this opportunity to thank all those clubs for their kind messages of condolence in connection with our fatal accident last Sunday. Mr. Critchley was one of our most popular members, although only recently joined. He was a pilot of exceptional ability, and intended to make application for his "B" licence right away. One can only attribute the accident to an extremely unexpected error of judgment on his part; in fact, he was well out of the spin, and another 50 ft. would have been out of the dive. The club closed down on Thursday, and Mr. Little, Mr. Beck and some of the members attended the funeral at Bolton.

For the rest of the week we have had nothing but high gales and storms. The Club Dance is being held at the Riley-Smith Hall at Tadcaster, on February 29, from 8 p.m. until 2 a.m. Supper will be served from 10.30 p.m., and the tables will be arranged round the dance floor. Tickets may be obtained by application to Mr. Beck at the aerodrome, 10s. 6d. inclusive. It is hoped that at any rate our neighbours, Newcastle and Lancashire, will come over in large numbers.



Great Flying-Boat Cruise

AFTER remaining at Rangoon for one week according to plans, the four R.A.F. "Southampton" flying-boats flew to Mergui on February 13.

African Survey Flight

SIR ALAN COBHAM flew from Kisumu to Mwanza on February 7, and made an air reconnaissance of Lake Victoria. Next he reached Port Bell, Kampala, Sir William Gowers, the Governor of Uganda, being a passenger. On February 11 the "Singapore" flew non-stop from Khartoum to Mongalla, a distance of 820 miles, in 8 hours. The journey by steamer up the Nile would take a fortnight. A return flight to Kisumu was started on February 12 with two women passengers on board.

The Flight to Australia

MR. BERT HINKLER, who is flying towards Australia in long stages, in his "Avian" flew from Rome to Malta on Feb. 8 without a stop in six hours. He left for Benghazi, on the North African coast, the next morning and reached his destination by 1 p.m. Later in the day he continued the flight and reached Tobruk, where he spent the night. He was next reported at Ramleh in Palestine on February 11, where he left the following morning for Baghdad. He reached Basra direct from Ramleh, however, having flown the distance of 950 miles non-stop in 9½ hours. He left Basra for Karachi on February 13. He arrived at Karachi at 3.30 p.m., seven days after leaving England—the fastest flight yet made to India from this country.

Col. Lindbergh's South American Tour

ON his arrival at Havana in the afternoon of February 8, Col. Lindbergh completed his "goodwill flight" through Latin America without experiencing a single accident or serious delay. The Cuban delegation and the Pan-American

Conference welcomed him. He started from Port-au-Prince, Haiti, at 6.35 a.m., and was reported at one stage to be 2 hours ahead of his time, but as usual he reached his destination within a few minutes of the hour planned. Punctuality has been one of his most significant habits during this tour, despite the long and difficult stages traversed at times. He returned to St. Louis after a 1,200-mile flight from Havana in bad weather on February 13.

Costes and Le Brix's Fine Tour Ends

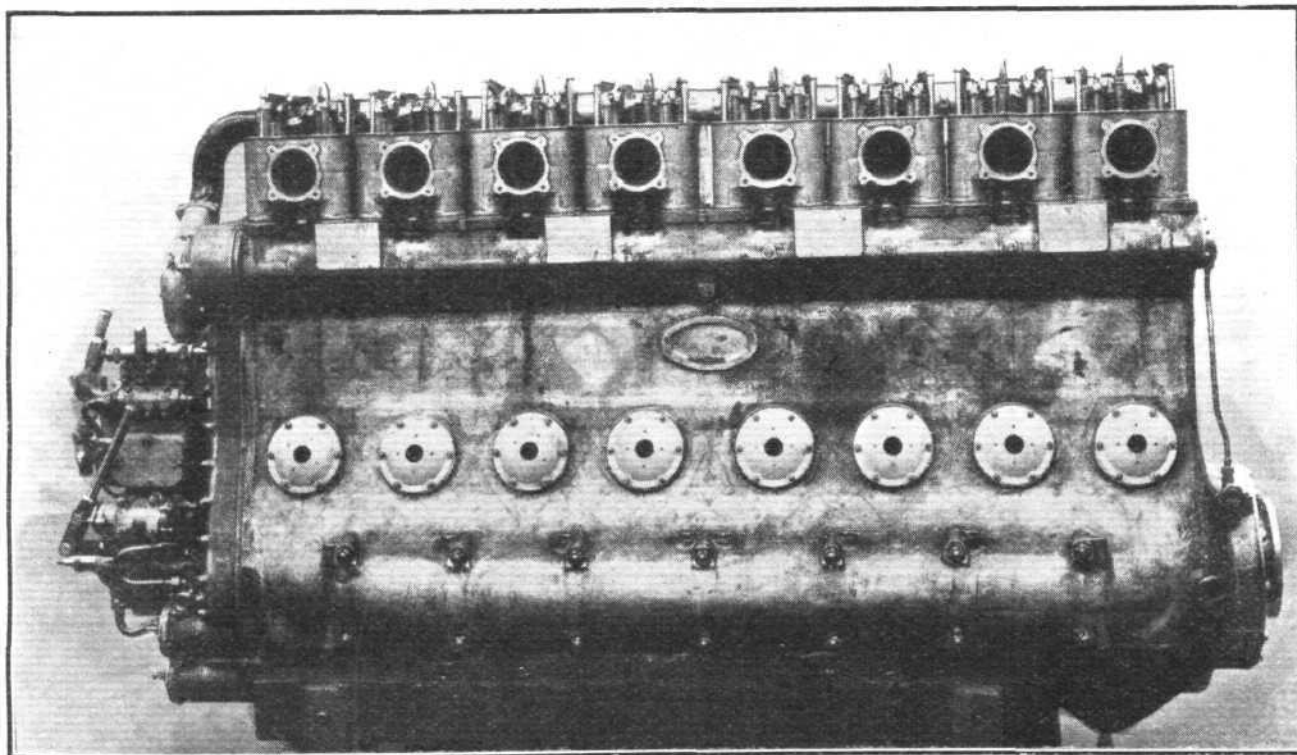
ON February 11, the long tour of Capt. Costes and Lieut. Le Brix's from Paris across the South Atlantic to South America and then up to New York, ended when they landed in their Bréguet military biplane at Long Island. They had flown 25,000 miles, and apart from their initial non-stop S. Atlantic flight, they had made many fine long distance flights. They were met by M. Mongendre, French Consul-General, Major Reynolds, Mr. Walker (Mayor of New York) and Mr. Raymond Orteig, donor of the \$5,000 prize for the first flight from New York to Paris, which Col. Lindbergh won. Well-known pilots who escorted them from the aerodrome, included Mr. Clarence Chamberlin, Mr. Bert Balchen, Mr. Floyd Bennett and Capt. René Fonck. It was rumoured many weeks ago that the two French airmen might attempt a flight from New York to Paris after this tour.

Portugal-India Flight

SEÑOR CARLOS BLECK, grandson of a British naval officer, left Lisbon for Melilla, on Feb. 9, on the first stage of a flight to Goa, Portuguese India.

Atlantic Airship Services

MR. HOOVER has announced after conferences with Commander Burney, M.P., that within 90 days there will be a regular airship service across the Atlantic for passengers and mails. The westward voyage is estimated to take



THE LATEST BEARDMORE AERO ENGINE: Induction side of the Beardmore "Tornado" Mark 1, which has been specially designed and constructed for airship work. The engine runs on heavy oil, so that fire risk is abolished. Low fuel consumption is one of the merits of this engine. The "Tornado" has eight cylinders, with a bore of 8½ inches (210 mm.) and a stroke of 12 inches (305 mm.). Designed to run at a normal speed of 1,000 r.p.m., the engine has a maximum permissible speed of 1,100 r.p.m. The normal b.h.p. is 650, and the maximum 720. The weight is approximately 3,000 lbs. (1,365 kg.).

48 hours, and the eastward voyage 38 hours. Americans will be invited to associate themselves with this enterprise if the voyage of the R.100 is successful. The Government has offered the mooring mast at Lakehurst, New Jersey, for the R.100 and will pay 12s. in the £ on American mail carried.

Italian Polar Expedition

GENERAL NOBILE, the Italian airship pilot and designer, arrived at Copenhagen on February 9 to buy provisions for his new North Pole expedition which is due to start from Milan at the beginning of April. His airship, *Italia*, is now ready. Sixteen scientists will be on board. King's Bay, Spitzbergen, will be the actual starting-off spot for the flight over the Pole. A landing will probably be made on the ice near the Pole for scientific research purposes.

R.A.F. Cairo-Cape-Cairo Flight

THE annual service flight of the Middle East Command of the R.A.F. from Cairo to the Cape and back will begin on March 1 next. The programme includes a stay at Nairobi from March 8 to 11, when the machines will carry out exercises in co-operation with the King's African Rifles. They are due at Cape Town on March 25, and will leave again on March 31, accompanied by four machines of the Union of South Africa Air Force. At Nairobi they remain from April 18 to 20.

Looping Records

GENE SHANK, a law student, is reported to have looped 515 times in 4½ hrs. at St. Paul, Minnesota, on February 5. This exceeds, by 200, the total made by the French pilot, M. Maynard. *Les Sports* points out, however, that in 1920 Alfred Fronval did 962 loops in a little more than 4 hrs.

This craze for looping has seized America. It is reported now that a Mr. Charles ("Speed") Holman looped 1,093 times during one flight and only gave up when his petrol gave out.

From Germany to Japan

HERR OTTO KONNECKE, who is flying towards Japan on his Caspar machine, named "Germania," passed over Calcutta on February 11, but failed to locate the Dum Dum Aerodrome, although daylight rocket signals were sent up. He subsequently made a forced landing in the dark on the outskirts of Calcutta.

New York-Ostend Air Race

WHILE staying in America recently, M. Sayag, director of the Kursaal at Ostend, decided to organise an air race from New York to Ostend, with prizes of 1,000,000 fr., 200,000 fr., and 100,000 fr. Fifteen pilots of various nationalities have promised to enter.

A Royal Passenger

ON February 9, Maj. Cochran-Patrick—who is in charge of the Aircraft Operating Co.'s survey expedition on the Zambesi River—carried as passenger Princess Marie Louise during a flight (in a D.H.9—"Nimbus") over the Victoria Falls and Livingstone.

Aerial Photography in Canada.

AN area of 45,850 square miles, larger than the whole of Cuba, was photographed in Canada from the air in 1927 by the Royal Canadian Air Force for the Topographical Survey Branch, Department of the Interior. Photographs of this wide stretch of territory taken for map making and other purposes numbered 62,586. Of the 45,850 square miles,

26,650 square miles were photographed obliquely and 17,200 square miles by vertical photography. The oblique photographs taken numbered 16,246, and the vertical 46,340. The work was carried on in eight of the nine provinces of Canada. Individual operations included such large items as the extension of oblique photographs over an area of 15,200 square miles west of Lake Winnipeg for forestry purposes; an oblique photograph operation covering an area of 8,000 square miles over the Wood Buffalo Park near Fort Smith, Northwest Territories; and a considerable number of vertical photographic operations of smaller individual areas throughout various parts of Canada.

Civil Aviation in East Africa

MR. F. TYMMS, Air Ministry Superintendent, Cairo-Karachi Civil Air Service, stationed at Cairo, arrived at Kenya recently on a six months' investigation into the question of the development and control of civil aviation in East Africa.

Paris Aero Show this Summer.

HITHERTO the International Aeronautical Salon at the Grand Palais de Champs Elysées, Paris, has been held at the end of the year, but it is announced that this year's show—the eleventh—will be held on June 29, and will remain open for a fortnight. It is suggested that this change of date has been decided upon in order that the Paris show may come before the Berlin Aero Show, which is being held from October 7 to October 28. Following the close of the Paris Show a big flying meeting will be held near Paris.

Helium Gas Discovery in Germany

HUGE volumes of natural helium gas are reported to have been found in Rüsselsheim, an industrial town situated between Mainz and Frankfurt.

A Junker Commercial-War Model

A JUNKERS three-engined all-metal machine has been built in Sweden to German designs. It is similar to the Junkers commercial type, but it is potentially a war machine, having gunners' cockpits, and being adaptable to day and night bombing as well as fighting.

A Notable Resignation.

GROUP-CAPT. J. H. SCOTT, Director of the Royal Canadian Air Force, has resigned in order to enter business. Wing-Commander J. L. Gordon succeeds him.

Twenty Years Ago!

Extract from "The Auto" (Precursor of "Flight"), Feb. 15, 1908.

"British Experimenters to the Fore.—Judging merely by appearances, we cannot perhaps congratulate ourselves at the present time in possessing any great number of practical experimenters with aeroplanes, but it is impossible to say how far the subject may be receiving attention in secret. Mr. A. V. Roe is, as our readers know, actually at work with his aeroplane on the Brooklands track, and any day now he may be joined by Mr. Moore-Brabazon, who has also had a machine constructed. Not so long ago the component parts of what were apparently intended for a flying machine were seen on a trolley in London, and so recently as Thursday of last week a full-grown device suddenly emerged from its seclusion at Norbury. Such are the signs of the times, and British experimenters, we hope, will soon have some practical flying records to look back upon."

Seaworthiness

THE Blackburn "Iris II," which is at present undergoing trials at Felixstowe, has been "making history" in a quiet (but not too quiet) way. Among her accomplishments has been successful taking off with an overload of 7,000 lb. During the recent gales she was moored out, and in a wind of 75 m.p.h., she dragged her moorings 50 yards, although the said moorings included such trifles as 2-ton sinkers! The machine sustained no damage, so that she may be claimed to have attained a modicum of seaworthiness!

Drink Licence for Croydon

A FULL licence for the buffet in the administration offices at Croydon Aerodrome was granted on February 8, subject to the buffet not being used by the aerodrome staff. The Air Ministry supported the application.

New Aircraft Carrier

H.M.S. COURAGEOUS was commissioned at Devonport on February 14, for service with the Mediterranean Fleet as a second aircraft carrier. The flights on board will be commanded by Wing Commander R. Leckie, D.S.O., D.S.C., D.F.C.

Rifle Shooting

THE Royal Air Force R.A. will hold its prize meeting this

year between June 3 and 9 to avoid clashing with the R.A.F. display, as the latter absorbed many potential competitors in the past.

S.5 on View Again

THE King will open the British Industries Fair at the White City this month, at which the Supermarine Napier S.5 will be exhibited; the machine in which Flt. Lt. Webster won the Schneider Trophy last year.

Morris Six-Wheelers for the R.A.F.

ORDERS have been placed to an amount of over £200,000 with Morris Commercial Cars, Ltd., of Birmingham, for a fleet of 327 six-wheeled vehicles to serve the needs of the Royal Air Force at home and abroad.

Aero Engines in War

WING COMMANDER I. G. V. FOWLER gave a lecture before a joint meeting of the Royal Aeronautical Society and the Institution of Automobile Engineers on Feb. 7. His subject was "Aero Engines in War."

Air Line Record

FLYING a Handley-Page (Napier) air liner with a full load of passengers and freight from London to Brussels on February 11, Capt. H. Parry made the record time for this type of machine of 85 mins.

THE ROYAL AIR FORCE

London Gazette, February 7, 1928.

General Duties Branch

Flying Officer (now Flight Lieut.) R. H. Horniman is granted a permanent comm. (Nov. 1, 1927). Sqdn. Leader J. J. Breen is placed on half-pay list, scale B (Feb. 6).

Stores Branch

Flight Lieut. G. Baker is placed on half-pay list, scale B (Feb. 1).

Accountant Branch

Pilot Officer on probation R. S. Sweet is confirmed in rank and promoted to rank of Flying Officer (Dec. 4, 1927).

Medical Branch

The following Flying Officers are promoted to rank of Flight Lieut. (Feb. 1): G. E. Church, M.B., E. J. Jenkins. Flight Lieut. G. J. Griffiths is transferred to Reserve, Class D.ii (Feb. 11).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

Flight Lieut. A. E. Woodbridge ceases to be employed with the Regular Air Force (Feb. 1). Pilot Officer I. C. Horton is promoted to rank of Flying Officer (Feb. 4).

The following Flying Officers are transferred from Class A to Class C:—T. Brewin (October 24, 1927). D. P. Cameron, M.B.E. (Feb. 7). Flying Officer H. G. Herbert relinquishes his comm. on completion of service (Sept. 18, 1927).

AUXILIARY AIR FORCE

Chaplains' Branch

The following to be Chaplain, with relative rank of Squadron Leader:—No. 803 City of Glasgow (Bombing) Sqdn.—The Rev. W. B. C. Buchanan (Feb. 7).

SERVICE RUGBY FOOTBALL

Royal Air Force v. Royal Navy*

Two circumstances militated against the chances of a good game on Saturday last. It is always unfortunate when an International and a Service match are arranged for the same day, and on this occasion England was playing Ireland at Dublin. This did not, as a matter of fact, cause so many gaps in the Service teams as sometimes happens, but it did rob the Air Force of its best forward, Flying Officer G. R. Beamish (Ireland), while the Navy lost Lieut. K. A. Sellar, the England full back, and Lieut. Harry Stephenson, the Ireland wing three-quarter. Consequently, only two men with International caps were playing at Twickenham, Flying Officer R. V. M. Odbert and Lieut.-Comdr. P. B. William-Powlett. There were other notable absentees from the Air Force team, e.g., Flying Officers F. V. Beamish and J. S. Chick. The forwards seemed to miss Chick's brilliance in the loose.

The second unfortunate circumstance was the wind. On the preceding night it had wrought havoc with London's roofs and chimney-pots, and during the game it was still very lively. Twickenham is well protected by its mountainous stands; but the wind came in through the breathers on the north side, set all the touch-line flags dancing quadrilles in most diverse directions, transformed stray bits of paper into fascinating gliders, soars and parachutes, and made high punting a matter of pure speculation. The R.A.F. selectors ought to have included a gust-guesser in their team, but they had omitted to do so, with the consequence that even passes sailed eccentrically away from the hands held out to receive them. It was quite comical on one occasion to see Sqdn.-Ldr. Russell lying where he fell at the base of the scrum, studying the flight of a pass which he had intended for Flying Officer Odbert, but which very nearly went to Flying Officer Hale Munro at full back.

The uncertainty of kicking and passing, the sure and relentless tackling of all the outsiders, and the tireless energy of both packs of ramping forwards, all combined to spoil the chances of pretty combined play by the outsiders. It was mainly a forward game, and as a forward game the play was of quite high class. The Navy had a bit the best of things in the scrum, not so much in shoving as in hooking, but in the loose there was little to choose between the two packs. Even without Chick and the brothers Beamish the R.A.F. pack went terrifically fast and all together in the loose, and they kept up the pace pretty well to the end. When a man was grassed, he had hardly touched the ground before a scrum had formed over the bodies of him and his tackler. The Air Force forwards also showed themselves capable of handling, and several times gained ground by short passes among themselves as they rushed.

* Played at Twickenham on Saturday, February 11, and won by the Royal Navy by one goal (5 points) to nil.

At half-back the Air Force were superior. Round the scrum Russell gave Forbes a very trying time, and when the latter hurt his ankle 10 minutes before half-time, the difference naturally became even more marked. In all the loose work, too, Russell played excellently and kicked with the skill and judgment of an old hand. Once he brilliantly stopped a Navy attack by making a mark off a Navy punt ahead, when running towards his own goal. Odbert, too, played well, and was one of the few men on the field who tried repeatedly to break through the opposing centre—but he always found the Navy's tackling too good for him.

The three-quarter lines on both sides were about equal in merit, and both were much better in defence than in attack. Most passing movements on both sides went across the field without gaining a yard, as the centres on both sides found it utterly impossible to cut through against such deadly marking. The Navy men, however, had more resource and ingenuity in winning advantage from difficult situations. Their kicking to touch was altogether better than the Air Force kicking. It was opportunism on the part of Lieut. W. H. Wood which gave the Navy its sole, but decisive, score.

At full back the Navy had a sound substitute for Sellar in Midshipman C. G. Goslin, while Hale Munro, unfortunately, was quite off his game; he fumbled in fielding and catching, and his kicks lacked length and often failed to find touch. Very largely from this cause, the R.A.F. did not reap full advantage from the favouring wind in the first half. Hale Munro was, however, hardly to be blamed for failing to tackle Wood when the latter scored. It would have taken a very fast and clever full back to have stopped that dangerous runner when he was well away with full scope for swerving.

The Navy kicked off against the wind at 15-05 hrs., and the Air Force quickly got the ball out to their three-quarters and commenced to attack. Usually, in a Service match, the passing is inaccurate at first, but improves as the game goes on; but on this occasion, both lines of three-quarters handled with accuracy at first, only to take to fumbling later on. The Navy repulsed the attack by good kicking, and when Hale Munro ran into touch with the ball, the game was brought down to the R.A.F. 25 line. The Navy were given a couple of free kicks, which were not very valuable against the strong wind, and then the Air Force returned to the attack. Aircraft Apprentice P. B. Coote (who played a sterling game) brought down a Navy man with the ball on the Navy's 25 line, and for a short time the Air Force pressed. L. A. Collins ran backwards with the ball and got tackled, which brought the Navy up again; but Pott cleared with a useful kick. Several free kicks were given to both sides, and from one the Navy tried for a goal. The kick had sufficient length, but went wide. Shortly afterwards, the Air Force also had a try for a penalty goal from half-way. Coote made a very good



SERVICE RUGBY FOOTBALL: R.A.F. *versus* R.N. A line out on Navy ground in the second half of the match played at Twickenham, on February 11.

attempt, but the wind, which was then dropping somewhat, did not give all the help which had been hoped for.

Just before half-time, the Navy dribbled over the line, but allowed too much for the wind, and kicked the ball dead. Half time came with no score, and the honours nearly even. But the Navy had had slightly the best of things against the wind, and would probably do better with the wind behind them. The R.A.F. had lost a good deal of ground by giving away free kicks for feet up in the scrum.

The second half opened with bad passing by the Navy three-quarters. The wind once more increased in violence, and the Navy rushed to the attack. A mark drove them back a little, but they soon looked dangerous again. Gosling dropped at goal, but the ball hit an upright and rebounded into play. Then the R.A.F. made a good rush, passing the ball from hand to hand and got past the half-way line. Odberth started this movement and Russell took a prominent part in it. A good run by Wood ended in touch at the R.A.F. 25 line. Christie cleared for a time with a good dribble, but the Navy worked the ball back.

At 16.20 hrs., the R.A.F. heeled and started a passing movement out to the right. It gained no ground, and ended in a fumble. Wood, who was right up on Coote, snatched up the ball and dashed clear of the Air Force three-quarters. He swerved into the centre, made a ring round Hale Munro, and ended up by grounding the ball between the posts. It was a fine individual effort, and was duly rounded off by an accurate kick at goal.

The rest of the game was mainly in the Air Force half of the ground, but the defence did not break down again. Wood punted over the line again, but kicked too hard, and the ball went dead. One dangerous rush was stopped by Russell's clever mark, which was mentioned above. Cook, the Navy's stand-off half, attempted to slip through the centre, but though he made some ground, he was duly tackled without being able to make an opening for his three-quarters. The final whistle left the Navy just victors. They were the better side by just a little, and yet they were rather lucky to win as they did. Had Gosling's drop kick gone a couple of inches more to

the right, there would have been a Navy victory which no one could have called lucky.

THE TEAMS

ROYAL NAVY. Full back: Midshipman C. G. Gosling (R.N.E. College, Keyham). Three-quarters: Left wing, Lieut. W. H. Wood (H.M.S. *Harebell*); left centre, Lieut. A. R. Freeman (H.M.S. *Victory*); right centre, Lieut. C. R. Garrett (H.M.S. *Frobisher*); right wing, Lieut. J. Plunkett-Cole, R.A.N. (H.M.S. *Dryad*). Half-backs: scrum, Sub-Lieut. J. H. Forbes (H.M.S. *Excellent*); stand-off, Lieut. G. R. Cook (R.N.E. College, Keyham). Forwards: *Lieut.-Commander P. B. William-Powlett (Capt.) (H.M.S. *Rodney*), Sub-Lieut. J. W. Linton (H.M.S. *Dolphin*), Lieut. D. P. Trentham (H.M.S. *Dolphin*), Lieut. A. A. Havers (H.M.S. *Victory*), Sub-Lieut. H. C. Browne (H.M.S. *Dolphin*), Surgeon-Lieut. J. B. Osborne (H.M.S. *Vivid*), Lieut. J. W. Cuthbert (H.M.S. *Excellent*) Lieut. W. C. Thomas (H.M.S. *Constance*).

ROYAL AIR FORCE.—Full back: F.O., T. A. Hale Munro (No. 29 Sqdn. Duxford). Three-quarters: right wing, Aircraft Apprentice P. B. Coote (R.A.F., Halton); right centre, P.O., J. R. H. Pott (No. 111 Sqdn., Duxford); left centre, F.O., F. S. Hodder (No. 13 Sqdn., Andover); left wing, F.O., C. H. G. Bremridge (No. 5 Flying Training School, Sealand). Half-backs: stand-off, *F.O., R. V. M. Odberth (Capt.) (No. 58 Sqdn., Worthdown); scrum, Sqdn. Ldr. J. C. Russell, D.S.O. (Air Ministry). Forwards: F.O., C. J. S. O'Malley (R.A.F. Hospital, Halton), Flight-Sergt. G. F. Cockell (R.A.F. Depot, Henlow), Aircraftman W. Munkley (R.A.F. Depot, Henlow), P.O., H. A. Constantine (No. 56 Sqdn., North Weald), Flight-Lieut. C. D. Adams (R.A.F., Halton), Corporal M. G. Christie (R. A. F. Depot, Shrewsbury), F.O., P. G. Chichester (No. 9 Sqdn., Manston), Leading Aircraftman S. G. Collins (R.A.F. Base, Gosport).

F. A. DE V. R.

* International.

GLOSTER AIRCRAFT COMPANY'S ANNUAL DINNER.

The annual dinner, on January 28, of the Gloster Aircraft Company's Engineering Department proved to be an unqualified success under the presidency of the Engineering Department Manager, Mr. Gordon Charley. Mr. Charley was supported by Mr. David Longden (Chairman and Managing Director), Mr. F. McKenna (Production Manager), Mr. F. Willis (Manager, Sheet Metal Department), Mr. E. C. Green (Chief Inspector), Mr. F. Radcliffe (Design Department) and a company of about 100.

After the toast of "The King," Mr. Charley proposed the toast of "The Gloster Aircraft Company." In the course of his speech he said how incomplete the toast would be without the name of their Managing Director, Mr. David Longden. It was through him and his co-directors and their untiring efforts that the firm was engaged today in metal aircraft. This was fully appreciated by all present, and it was realised how much the employees depended on the success of those efforts for there being work or not.

Mr. Charley said that during slack times engineers had to move about the country. This was very expensive and also very unsatisfactory. However high the wages paid, this state of affairs could not continue. The firm, however, had endeavoured to keep work constant, and it was up to each to do his best for the firm when it was carrying him as a dead load in the process. This year, he thought, promised to see the turn of the tide for engineers.

Continuing, Mr. Charley remarked that at a recent bankers' dinner, he noted in the report that 50 per cent. of the world's new shipping had been built last year by British industry. Turning to another aspect of trade, he remarked how recently England had sent over to America locomotives for the tests on the American railroads, and proved their great superiority. The same distinction must be achieved by British aircraft and trade would follow.

Then followed the toast of "The Gloster Aircraft Co. and Mr. Longden," which was received with acclamation.

In replying to the toast, Mr. David Longden expressed his appreciation of all the kind remarks made, which he knew to be genuine, and which consequently made him feel the more the responsibility which was his towards all. During the time that he had been in Cheltenham, which now extended over 20 years, he had seen the steady growth of the company, thanks to the loyal band of workers with whom he had had the pleasure of co-operating. The effect of the firm's great development on Cheltenham was perhaps not sufficiently realised locally.

He pointed out, for example, that during the past year £200,000 had been paid out in wages, an item which was bound to affect the living conditions and social amenities of the town, and he added that it was his aim to maintain that standard. Continuing, Mr. Longden stated that no doubt those present were interested in what was likely to be the firm's policy, and the prospects for the ensuing year.

The last year, he stated, had been a very difficult one, but extremely interesting for him, as they had completely changed over from wood to metal. This time last year their aircraft were all-wood, but today they were all-metal. This, he reminded the company present, presented a problem which was to create new conditions during the year, which would meet the new circumstances.

The need for the change over from wood to metal had been fully appreciated for some considerable time, and it was with a view to meeting this new state of affairs that the Steel Wing Company and many patents were taken over, to put them on a par with any other aircraft company in the country. But nothing could be done, he remarked, unless each man played his own individual part, and this, he continued, had been proved during the past year.

In the Glosters IV, IVA and IVB, they had machines of which they were rightly proud and which were a credit to all. Both the works and the design side had produced machines which were second to none for competition in the Schneider Race, and it was through no fault of theirs that the machine did not complete the course.

As regards personnel, Mr. Longden referred to Mr. Charley as a manager whom all could appreciate, for he seemed to combine in a happy way both the firm's and the individual's points of view, and did his best to promote good fellowship among all. It must be remembered that "all" are the firm. Many were making homes here, and the firm wanted to keep those homes happy.

He stated that they also owed a great deal to Mr. Folland, their chief engineer and designer. They all appreciated his efforts. They held great hopes for the machines just turned out and no efforts would be spared in their endeavours to get production orders.

Mr. McKenna was then referred to, and Mr. Longden remarked that his untiring efforts were fully appreciated by them all.

Referring to the remarks made by Mr. Charley on America, Mr. Longden said that he could not let it pass without saying, as he had said in the *Gloster Magazine*, that the best brains in the world were being concentrated on the aircraft industry. During this last year in America, much had been done by Col. Lindbergh's flight and by their large mail services. These two facts alone demonstrated the capabilities of commercial aircraft, and helped the Americans to gain orders for producing machines in big numbers. They, in this firm, must concentrate on the commercial side as it seemed most promising, and it was interesting to be able to tell those present that at the present time they were producing a Survey machine.

Mr. Longden stated that he believed this type of machine was a really sound commercial proposition. With passenger machines, risks were great, but for survey machines they had a market for which they must strive in our Empire.

He expressed great indebtedness to Mr. Jeffery and Mr. Hamlin for their co-operation in the work of the department.

Mr. McKenna proposed the toast of "The Engineering Department," and stated how much he appreciated the honour that had been conferred upon him in proposing the toast.

Mr. Charley, in replying to the toast, said that he appreciated all the kind remarks that had been passed, but assured those present that they had a right to be proud of the metal propellers and the all-metal wings which had been constructed. He concluded his remarks by appealing for a helping hand to be given to the young men who were not fully trained apprentices through their having taken up military service during the Great War.

The programme, which then followed, was delightfully executed and well varied. Banjo solos and duets were given by Messrs. Turner, Hamlin and Loving. Songs were given by Messrs. Groves, Harding, and the Orpheus Glee Singers. The latter proved to be a really star turn. The comedians (and they were very good) were Mr. Vaughan, Mr. Jones and Mr. Lyons. The accompanist part was skilfully rendered by Mr. J. Cook.

BOULTON AND PAUL (AERONAUTICAL DEPT.): ANNUAL STAFF DINNER

Norwich Aircraft Designers Flap their Wings

A most enjoyable evening was spent at the Café Royal on February 3, when a company of 40 P.B.D.'s and others "taxied along" to one of the best restaurants in the city for "refuelling" in celebration of a member of the D.O. who was leaving the aircraft industry for a more lucrative occupation.

The fare was only surpassed in excellence by the programme, musical and otherwise, which followed. Mr. Odgers, Chief of the Research Department, occupied the chair, being supported by Messrs. Bennell, Hughes, Johnston, Bolton, Pickthorne and Larnder. The A.I.D. was represented by Messrs. Stevens and Norton. The toasts were many and the responses appropriate. Mr. Bennell, chief draughtsman, in responding to the toast of "The Firm," disclosed some very interesting statistical points relating to the aircraft work which had been carried out during the last year, and the success of the company in the same. He emphasised how important was the position of the poor draughtsman in an aircraft works.

Several of the speeches were very humorous, and the A.I.D. representatives were considered to be promising heavy weight lifters by their recent activities in holding up various components!

The guest of the evening, Mr. E. Cox, one of the aforementioned P.B.D.s., vice-captain of the cricket club, and a prominent player in the football team, was the deserter, as is mentioned above.

At the close of the evening many of the P.B.D.s and others reached their "stalling speed," but by rapid "acceleration" ("nose-diving" in one case) and "close formation" arrived at their "hangars" without serious injuries or damages.

At the close the organisers, Messrs. Lowden and Warren, were warmly thanked for their work in connection with the above dinner.

FLIGHT,

The Aircraft Engineer and Airships

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